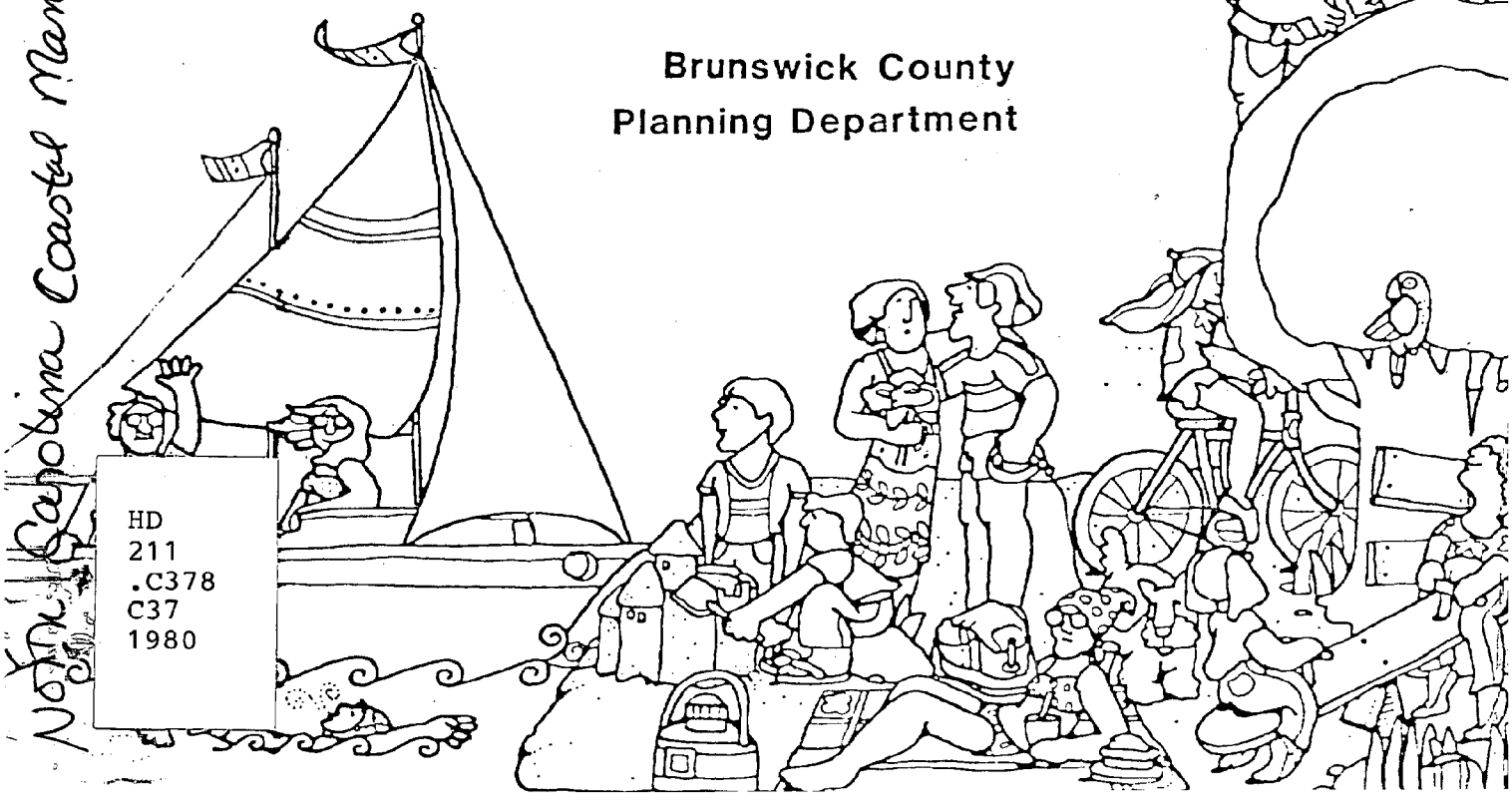
Caswell Beach
North Carolina

LAND USE PLAN
1980
Final Draft

Brunswick County
Planning Department



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Prepared by
The Brunswick County
Planning Department

June 1980

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INTRODUCTION

The Coastal Area Management Act

"In recent years the coastal area has been subjected to increasing pressures which are the result of the often conflicting needs of a society expanding in industrial development, in population, and in the recreational aspirations of its citizens. Unless these pressures are controlled by coordinated management, the very features of the coast which make it economically, esthetically, and ecologically, rich will be destroyed."

In 1974, the North Carolina General Assembly passed the Coastal Area Management Act (CAMA) in an effort to effectively manage the development of twenty coastal counties. The Act notes that, "among North Carolina's most valuable resources are its coastal lands and waters. The coastal area, and in particular the estuaries, are among the most biologically productive regions of the state and of the nation. Coastal and estuarine waters and marshlands provide almost 90 percent of the most productive sport fisheries on the east coast of the united States. North Carolina's coastal area has an extremely high recreational and esthetic value which should be preserved and enhanced."

Adoption of the CAMA empowered local governments in the twenty North Carolina coastal counties to exercise control over their future. The Act designs a state-local cooperative program in which local govetnments shall have the initiative for planning by preparing a blueprint for their future growth and development and the State government shall establish Areas of Environmental Concern where lands are environmentally sensitive to the prospect of development. With regard to planning, State government shall have and advisory role, setting guidelines and standards, and a reviewer's role, evaluating the local land use plans. In addition, the State makes grants to finance local planning and work jointly with local governments to enforce the adopted plans.

The CAMA permit process began March 1, 1978 throughout the entire coastal area of North Carolina. After this date, any development in an area of environmental concern requires a permit. The permitting process is divided inot 2 classes; major permits for large scale developments, and minor permits for houses and other small structures. The major permitting process is administered by the North Carolina Department of Natural Resources and Community Development. The minor permitting process process is administered locally by the Southport Building Inspector.

The entire CAMA planning process has been oriented towards citizen participation and has continually provided mechanisms for citizen input into the preparation of the land use plan. The primary input has taken the form of future growth policiesand identification of existing problems and issues and desired future services. During the local planning process, efforts must be made to secure theis public participation

The land use plans which are prepared by local govenments in the coastal area are distributed widely and have many uses. Among the users of the plans are local governments, regional councils of government, state and federal permitting agencies and public and private funding and development groups.

Local Government Uses - Counties and municipalities may use the local land use plans in their day to day business and in planning for the future. Often times, the land use plan provides guidance in local policy decisions relating to overall community development. The plans also provide the basis for development regulations and capital facility planning and budgeting. By delineating how the community wishes to grow, the land use plans help to assure the best use of tax dollars as public utilities can be extended to the best areas for growth.

Regional Uses - The regional councils of government or planning and development commissions use the local land use plans as the basis for their regional plans and in their function as regional clearinghouse for state and federal funding programs. The local plans can indicate to these regional decision makers what types of development the local community feels are important and where the development should take place.

State and Federal Government Uses - The local land use plans are used as a major component in the granting or denial of permits for various developments within the coastal area. The State and federal agencies must be sure that their decisions consider the policies which are set out by the local governments in their plans. This is also true for decisions relating to the use of federal or state funds within the coastal counties. If a local plan sets out policies relating to various types and locations of development, the funding and permit decisions must be consistent with the local policies. Projects being undertaken by State and Federal agencies themselves must also be consistent with the local plans.

1980 Caswell Beach Land Use Plan

The scope of the 1980 Caswell Beach Land Use Plan includes a community profile, land use survey and analysis, and a land classification map. Specifically, a summary of data collected and its analysis, maps of existing land use and desired land use, Areas of Environmental Concern, assessments of current problems, and policy statements are presented. Because the 1980 United States Census has not yet been published, population figures for 1985-on are projections bases on information from state and local sources. Therefore, some of the data presented needs to be updated with the publication of the Census, and it is possible that the data presented is deceptive, but it is not thought to be totally unrealistic.

In preparation of the Caswell Beach Land Use Plan, several tachniques were used to elicit input from the public in the planning process. These include local meetings with citizens and planners, a citizen survey, local weekly newspaper coverage, and a "dial-a-planner" service. The citizens have also been encouraged to comment on preliminary land use and land classification proposals. Significant comments have been incorporated in the final land classification map appearing in this plan. The public participation process for Caswell Beach is explained in further detail in the text.

PART 1: COMMUNITY PROFILE

CASWELL BEACH

POPULATION REPORT

Introduction

The basis for most planning studies is the population, both current and projected, for the geographic area covered in the study. All planning services such as streets, fire protection, recreation, water, sewer, and garbage collection are related directly to the population they serve.

Caswell Beach also has a Seasonal Population that must be considered along with the resident population for they too create demands on some services and facilities, especially water, septic and roads.

Another factor to be considered is the density pattern. Typically, areas of population concentrations have a greater need for certain services, especially water and sewer, than areas of low density populations.

The historic population statistics show the change and trends that have and are occurring. The population of a given area is never static and change is always occurring. That is why planning is by necessity, an on-going process adjusting periodically as changes occur.

Therefore, it is the purpose of this section to provide the basic population data on which current and future needs for services and facilities and future permanent and seasonal residential land requirements can be determined.

Current Population

Caswell Beach has consistently been one of the County's lowest ranked population centers. Since 1975, the permanent and seasonal populations have increased by over 60%, but still the City is ranked low on a County scale.

Based upon past surveys, the Caswell Beach permanent population in 1970 was 36, the seasonal population 249. By 1975, the permanent population had grown to 53 and the seasonal to 366. This was a 47.2% growth for permanent population, and a 46.9% increase for seasonal population. In 1980, the permanent population was 85 and the seasonal 587. This is a 60.4% increase for both populations.

Another method of determining growth is by analyzing the growth of Caswell Beach as a percentage of Smithville Township and County populations.

Smithville Township has about 19.1% of the County's population. In 1970, the population of Smithville Township was 4,346, making the permanent Caswell Beach population .83% of that total. In 1980, the population of Smithville Township had risen significantly to 7,274, with Caswell Beach increasing to 1.17% of the Township population.

In 1970, the permanent population of Caswell Beach was .15% of the County's population of 24,223. In 1975 Caswell Beach was still .15% of a County population of 35.621, and by 1980 the City's permanent population had increased to .22% of a County population of 38,100.

The seasonal population of Caswell Beach has consistently been much greater than the permanent population, with growth rates for seasonal and permanent populations from 1970 to the present having remained approximately equal. The seasonal population has been consistently about seven times as great as the permanent population.

The total seasonal population of Caswell Beach is also far below that of neighboring beach communities but among the top percentage-wise. However, it is important to consider this population seriously because of their demands for City services and their affect on the economy.

CASWELL BEACH POPULATION CHANGE - 1970-1980

Year	Brunswick County	Smithville Twp.	Caswell Beach Permanent	Caswell Beach Seasonal
1970	24,223 (+19.5%)	4,346 (+29.5%)	36 (N/A)	285 (N/A)
1980	38,100 (+57.3%)	7,274 (+67.4%)	85 (+136.1%)	419(+47.0%)

Sources: 1970-U.S. Census
1980- Caswell Beach town records; N.C. Dept. of Administration for the County figure; and Brunswick County Planning Dept. projection for Smithville Township.

On a township level, statistics are available concerning white/ non-white population, household composition, population characteristeics, and migration rates.

While the total population of Brunswick County increased by 18,862 from 1950 to 1980, the non-white population increased by only 4,465. Between 1950 and 1980, the percentage of non-white population dropped from 36.7% to 30.18% in 1980.

Of the 4,465 non-white increase, 2,073 were males and 2,392 females. Percentage-wise, the non-white males in relationship to the total males dropped from 35.7% in 1950 to 29% in 1980, and the non-white females declined from 37.5% to 31.2%. It would seem that slightly more males than females migrated from the County but no natural increase statistics by sex are available to confirm this.

Township statistics are available only for 1960 and 1970. Estimates for 1980 were made by the Brunswick County Planning Department for 1980.

Non-White Population Change by Township 1960 - 1970

	1960			1970			
	Total Pop	Non-white	% Non-white	Total Pop	Non-white	% Non-White	1960-1970 Change
Brunswick Co.	20,278	7,175	35.4	24,223	7,443	30.7	268
Smithville Twp.	3,355	1,144	34.1	4,346	1,193	24.4	49

Non-white Population Change by Township 1980

	Total Population	Non-White	% Non-White	197--1980 Change
Brunswick Co.	38,100	9,335	24.5	1,921
Smithville Twp.	7,274	1,617	23.2	445

Household Composition

Household composition was also estimated for Brunswick County and Smithville Township. Analysis shows an approximate average household size of 3.47 for the whole county. The Township white household size is higher than that average for the county, and the Township non-white household size was smaller than that average for the county.

Township Household Composition 1980

	Brunswick County	Smithville Township
Total # Households	10,980	2,096
Household Population	38,100	7,274
Population per Household	3.47	3.47
# White Households	8,359	1,596
Household Population	28,765	5,657
Population Per Household	3.44	3.52
# Non-white Households	2,621	500
Household Population	9,335	1,617
Population per Household	3.56	3.32

Population Characteristics

The median age of a population, that is, the point at which half of the people are older and half are younger, gives a description of the age composition of a given population. The forces which normally act on the median age are births, deaths, and migration, and the complex interplay of these forces can drive the age either up or down. There is presently a nationwide trend toward lower birth rates, and this has caused the median age to rise slightly, since young people became a lesser proportion of the total. From 1960 to 1970, each segment under study (male, female, black, white) grew older. The median age for all groups in Brunswick County was 26.4 in 1970 as opposed to 23.9 in 1960. In 1970, Smithville Township registered 32.4, while the North Carolina figure was 26.5. The reason for this difference appears to be that Smithville Township contains a relatively large population of elderly people (those over 65) within its boundaries.

POPULATION CHARACTERISTICS: 1970

	Total	Male	Female	White	Black	Under18	Over 65	Med.Age
Brunswick	24,223	50%	50%	69%	30%	37.4%	8.4%	26.4%
Smithville Twp	4,346	49%	51%	72%	26%	32.4%	12.1%	32.4%
Southport	2,220	47%	53%	62%	35%	32.7%	12.9%	32.4%
North Carolina	5,082,059	49%	51%	77%	22%	34.6%	8.1%	26.5%

SOURCE: U.S. Census, 1970

Estimates of population distribution by race, sex, and age groups were also made for Brunswick County and Smithville Township for 1980 by the Brunswick County Planning Department.

1980 Population Distribution by
Race, Sex, and Age Group

	Brunswick County	Smithville Township
Total Population	38,100	7,274
Male	18,959	3,548
Female	19,141	3,726
White	28,765	5,657
Non-white	9,335	1,617
Median Age	28.4	N/A
Number Under 18	13,335	2,357
Number over 65	4,191	880

Migration Rates

Recent migration rates, population characteristics and median age figures are not yet available for Caswell Beach, Smithville Township, or the County. To create a general description of the population, 1970 Census figures are presented below. It is expected that this general description will change with the analysis of 1980 Census data. But, hopefully, the change will not be great.

Migration rates which were calculated for Brunswick County from 1960 to 1970 reflect the assumption that more and more of the County's people are staying in the County rather than moving out. A study done in 1969, for example, compared specific age groups in 1950 with the same groups a decade later in order to measure the percentage of persons who had remained within the County during that period (e.g. ages 25-34 in 1950 compared with ages 35-44 in 1960). In every case Brunswick had shown a loss of residents, that is, less than 100% remained ten years later.. From 1960 to 1970, the situation was altered significantly. Most age groups exhibited net gains (over 100%) during this span, and in each instance, the percentage of persons continuing to reside in the County was larger than during the previous enumeration. Although age breakdowns since 1970 have been unavailable, the reported substantial additions to the total population would lend support to the notion that currently, an even higher proportion of each age group is being retained. These statistics tend to indicate that Brunswick County is becoming an increasingly attractive area in which to live and work.

MIGRATION RATES: BRUNSWICK CO. 1950-60, 1960-70

	0-4	5-9	10-14	15-19	20-24	25-34	35-44	45-54
Age Groups in 1960	2441	2469	2417	1928	1125	2298	2509	2155
Same Group in 1970	2653	2320	1840	1542	1326	2634	2677	2320
Percent Remaining	109%	94	76	80	118	115	107	108
Percent Remaining 1950-1960	96%	81	54	61	81	94	92	88

SOURCE: Southport Population & Economy Study 1969 and Calculated from U.S Census 1970

CASWELL BEACH HOUSING REPORT

The Current residential dwelling count for the Caswell Beach planning area is 91. Sixty-nine, or 75.8% of those total units are seasonal, and 22, or 24.2% are permanent units.

Caswell Beach does not contain any mobile homes, substandard housing, or low-income housing.

CASWELL BEACH

ECONOMIC REPORT

Caswell Beach Economic Report

The economy of an area is constantly undergoing long term change. These changes affect the population in total numbers, in density and, therefore, the level of services required, as well as the economic well being of each person.

The destiny of an urban center is controlled by the extent and character of its productive and income - producing activity and its general vitality. That is, the urban economy conditions the amount of land development that occurs.

For these reasons, an investigation of the economy is an important part of the planning process. If the economic change is to industry, the population will normally increase with the concentration being near the major industrial area.

However, with todays means of transportation, workers commute greater distances than in past years. Too, industry normally increases the income of the area providing a higher standard of living.

So, regardless of the fact that Caswell Beach does not itself contain any industrial development, nor shall it ever likely contain any, the industrial development of the County as a whole is relevant to the growth of Caswell Beach. This is particularily true because of Caswell Beach's near location to the northeastern corridor of the County, the area projected to experience the majority of the County's industrial development.

The type of economy an area has also affects the tax base. Again, industrial development normally means costly plants and equipment that make a major contribution to the Ad Valorem Taxes, thus relieving the individual of some of his tax responsibility.

With so many areas being influenced by the economy, the elements of the economy must be considered as to its foundation, strength, stability and future. While the total economy of an area contributes to the total picture, certain activities are considered to be more important. These are the primary basic economic activities. The stability and growth of any area depends directly upon the stability and growth of these economic activities.

The future growth of an area can be somewhat guided through guidance of economic development. Through planned development, especially of industry, growth can be guided to areas best suited to sustain such growth.

These factors mentioned serve only as a brief and limited explanation of the importance of the economy of an area to its past, present and future and the necessity of considering the economic aspects in the planning process.

Because the residents of Caswell Beach depend upon outlying areas for their economic well-being, it is necessary to consider the Brunswick County Economic Report as a setting for Caswell Beach in creating a picture of the City's economy.

Industry

As Brunswick County has shifted from an agricultural/commercial fishing economic base to a more industrial base, during the past decade the economic well being of the County's residents has improved. There are many indicators of this other than the census reports. One such indicator is per capita personal income. In 1973 the per capita Personal Income for Brunswick County was only $2,911. By 1978 it had risen to $5,071. Industrial development in Brunswick and New Hanover Counties has contributed to this increase in per capita income.

In 1979, manufacturing was the leading employer and economic contributer to the County's economy. Commercial fisheries ranked second, and transportation and tourism ranked about third as employers. Agricultural activity was the second leading economic contributer, while tourism was the third.

Manufacturing

Due to its proximity to Southport, the residents of Caswell Beach have relied upon the manufacturing establishments of that city in the past, and will most likely continue to do so in the future.

For its size, Southport has a good number of manufacturing establishments, which employ County residents as well as Beach residents. Below is a list of firms located in the Southport area. This list was compiled by the Brunswick County Resources Development Office.

Firm	Employment Range	Products	Year Established
Blake Builders Supplies Supplies,, Inc.	20-49	Building Supplies, hardware, concrete	1950
Carolina Power and Light Company	250-499	Electrical power	1975
Caroons Crab Company, Inc.	20-49	fresh and frozen seafood	1965
East Coast Ice and Fisheries	20-49	Manufacture ice	1975
Pfizer, Inc.	100-249	Citric acid	1975
Sea-Way Press	1-4	Commercial printing	1967
Standard Products of North Carolina, Inc.	20-49	Fish meal, fish oil, and fish solubles	1922
State Port Pilot	1-4	Weekly newspaper	1928
Woodcraft Cabinet Shop	1-4	Custom- made cabinets, misc. woodwork	1974

It is important to note that no new industries or firms have located in the Southport area since 1975, when Carolina Power and Light and Pfizer companies located there. Both are major employers in the Southport area as well as the County.

Caswell Beach relies upon the Southport area in other economic areas as well as manufacturing. Below are some of the areas included in this economic reliance.

Fishing

Fishing is a major industry in the Southport area. Southport is the commercial and sport fishing center of the county, with largest amount of registered/licensed fishing boats. This is significant since Brunswick County is one of the leading seafood producers in the State.

Southport has a state owned boat harbor which was recently leased to a private operator. It is reported that the harbor is now doing much better and producing more revenue since the leasing. There is an adjoining harbor, the O'd Boat Harbor, which is run down and dilapidated. It is being considered for rehabiliation and historic preservation, but could also contribute more to the fishing industry providing better access and facilities. In the present state, it is definitely not producing or promoting as much revenue as it could be if it was in better condition.

Agriculture

Agriculture activity in the Southport area is almost non-existent. In the 1976 Land Use Plan, it was reported that Smithville Township had so little agricultural activity, that all acres in agricultural use would be included in the Towncreek Township reports.

Tourism

Although tourism is the third largest contributor to the economy of Brunswick County, its contribution to Southport's economy is relatively low. Besides tourists filtering over from Oak Island, or passing through in route to Bald Head Island or the Southport-Fort Fisher Ferry, most visitors are attracted primarily by charter and commercial fishing. Although a few Southport businesses may benefit from chance shopping and patronage at eating establishments, most tourist money is spent elsewhere.

Southport's geographical location may adversely affect its tourist business. It is in a rather out-of-the-way spot, and though this may be a charming asset to many residents, it could cause some prospective visitors to search for a more accessible place to vacation. This situation is compounded by the rising cost of gasoline which is already causing a decline in tourism throughout the entire county.

To combat this, Southport must continue to be more aggressive in attracting tourism, that being the general attitude of the public. Many Southport residents and businessmen feel that tourism should be encouraged, but in a positive way. Since there is an overall desire to maintain the "fishing village" atmosphere, the City should take advantage of those assets, possibly by rehabilitation of historic sites, cleaning up the downtown and waterfront area, and publicizing these historic assets to draw tourists to the City.

Caswell Beach itself does not rely upon tourism in any other way than their seasonal population, which is nearly seven times the amount of the permanent population. The only commercial imput that the seasonal residents might make to Caswell Beach is in membership dues to the Oak Island Country Club. Otherwise, the seasonal residents of Caswell Beach must go elsewhere to spend their dollars.

Commerce

The fourth largest occupation of Brunswick County residents is that of trade which includes all persons engaged in the sales of merchandise. Gross retail sales have risen steadily since 1973 for the County, with the greatest growth occurring since 1978. The annual increase, from 1978 to 1979 was as large as the total increase for the three-year period from 1973 to 1976.

Although recent retail figures for Southport are not available, it is probable that Southport merchants have not received their proportional share of the County increases due most probably to their failure to compete with other districts within the Southport market area.

Central Business District - Although Caswell Beach does not have a central business district, the residents of Caswell Beach have historically relied upon the central business district of Southport.

In the past decade, the economic viability of the downtown and waterfront areas of Southport has been jeopardized. To arrest any negative trends in the commercial areas, city officials adopted a Downtown and Waterfront Revitalization Plan in September 1979. Studies done in preparation of this plan by the Brunswick County Planning Department indicated an extreme problem of vacant buildings, due largely to the move of Brunswick County Government offices, and vacant lots, due to lack of demand for floor space in the Central Business District (CBD). In addition, a large number of buildings in the area housed professional offices, primarily attorney. It was also found that large portions of the land in the CBD and along the waterfront was owned by a few people, rather than a large number of individuals. A market analysis for the plan concluded that the CBD has been negatively affected also by the competition of shopping centers in the area. Southport has experienced reduced sales margins, vacancies and lack of capital for improvements. It has obvious from the analysis of goods and services offered in the CBD that business volume has decreased. (For a more detailed analysis, see, City of Southport Downtown and Waterfront Revitalization Plan, 1979.)

The significance of the trends mentioned above is that the Southport central commercial areas are showing definite sign of decline. The movement of the County offices to Bolivia has not only caused vacant buildings, it has also caused a decrease of pedestrian traffic. The professional offices draw some people into the CBD, but not enough to make a real difference. The nearby shopping centers draw people away who would have otherwise shopped in the CBD. It seems obvious that the Southport CBD must become an active competitor, in the market area in order to draw people back to the central commercial areas. To do this, changes in its physical appearance are being planned according to the revitalization plan. This will not be enough, however. Changes must be made in the ownership patterns and marketing techniques of establishments.

to make revitalization a success. Having a small number of people owning most of the commercial property stifles competition within the commercial areas. Competion between business establishments is a very important factor in the viability of a commercial area. Obsolete marketing techniques should be replaced by more contemporary techniques, taking the lead from the successful shopping center.

Steps to limit commercial development in outlying areas could also be taken in an effort to encourage new business to locate in the downtown areas. Currently, the Zoning Ordinance sanctions strip commercial development along North Howe Street, NC 133 and 211. This a major threat to economic stability and revitalization of the CBD.

Although this outlying commercial development has been a major threat to the economic stability and revitalization of the CBD, it has been frequently used by the residents of Caswell Beach because of its closer proximity than the CBD.

In the past five years various retail establishments have located in the CBD, however, most have not survived longer than six months. Offers to buy certain downtown properties have been made, but outrageous and prohibitive price tags have been attached to the deteriorating properties. Toursim, so far, has had little effect on the economy of Southport. Most tourists are headed for the surrounding beaches, just driving through, shopping by chance, or patronizing the eating establishments within Southport, and spending most of their money elsewhere.

Other Commercial Areas

Commercial development outside the downtown area along North Howe Street, NC 133 and 211 may act to mitigate the effect of the declining downtown. Southport intends to continue to develop these outlying areas. Many of establishments there benefit from the tourist traffic along these roads.

Four major restaurants and four motels are supported in Southport. These establsihments do not depend solely on tourist traffic since they are open year round.

The marinas are also commercial enterprises which do well in Southport, although, marina - type activities do not employ a large amount of people.

Finance and Real Estate

Activities of financial institutions, banks, and savings and loan associations have increased significantly in the past decade in the County.

Southport, at present, contains three banks, the largest of which has two branches. A savings and loan is also located there.

Real estate activities has also shown significant increases in the County, and Southport has a good share of real state establishments.

PART 2: MAJOR ISSUES, PROBLEMS, AND POLICIES

CASWELL BEACH

PUBLIC PARTICIPATION PROCESS

CASWELL BEACH PUBLIC PARTICIPATION PROCESS

Caswell Beach is a coastal community of about 85 permanent residents and 587 seasonal residents. With an approximate total of 22 permanent single family dwelling units and 69 seasonal single family dwelling units, the community has an average household size for permanent residential dwellings of 3.86 and for seasonal residential dwellings of 8.5.

Several techniques were used to involve these residents in the land use planning process for Caswell Beach. Local meetings with county planners, Town officials, and community residents were held. These meetings fostered public participation in the identification of community problems and issues and in the review of preliminary land use plans and the Town Policy Statement. Important issues were also reported upon in the weekly county newspapers. This helped to inform local residents and to create awareness of concerns which affect the community. Also, as a convenience to citizens with questions, concerns, and ideas about land use planning for Caswell Beach, a "dial - a - planner" service was in operation from February 1, 1980 to June 15, 1980. The service allowed those people unable to attend the local meetings to talk directly with a county planner. Finally, as an effort to involve citizens in the land use planning process, a questionnaire was sent out by the Brunswick County Planning Department to all property owners in the community. The survey sought opinions and attitudes that Caswell Beach property owners hold on issues regarding land use and development, service provision, capital improvements, and beach strand policy.

Although citizen participation by the permanent population in local meetings has been good with about ten percent attending, it was low in the survey. Participation from seasonal residents was higher. Approximately all questionnaires were sent out in the middle of February, 1980. Eighteen were returned, a response rate of 20 percent. Responses to the questions were then tabulated during the middle of March,

1980. The following represents an analysis of the opinions and concerns of the 20 percent who responded.

Resident Type

Residents answering the survey, for the most part, classified themselves as permanent residents.

A range of two to six people live in the houses, with most of the responses centering around two, three, and four people per house.

Those people who answered a question as to the age of residents in their home indicated that most were between the ages of 46 and 65 years. There were also many residents less than 25 years of age. The following is a breakdown of the age and sex of those residents who responded to the question.

Population

Age in years	Male	Female
0-25	8	6
26-45	2	3
46-64	8	8
65+	0	0

Work Place

Responses indicated that about 11 percent of the property owners work in the immediate area of Caswell Beach (2 responses) and about 67 percent work outside the immediate are (12 responses). Three respondents chose not to answer the question.

Major Problems Facing Caswell Beach

The property owners were asked to write out problems they felt were currently facing Caswell Beach. The most prevalent answers were erosion, litter, and inadequate police and fire protection. These three problems comprised 75 percent

of the total amount of responses (24) to this question. Other problems mentioned were the net fishermen, property protection, and maintaining low taxes.

Characteristics of Caswell Beach-Desirable and Undesirable

When asked what characteristics made Caswell Beach a desirable place to live, a majority of the respondents listed that the town was quiet, clean, and non-commercial. Being a family beach and uncrowded was also significant in making it desirable.

As for undesirable conditions in Caswell Beach, respondents listed a wide range of items. Erosion, litter, and fishermen with fishing nets were at the top of the list as the most undesirable conditions existing in the town. Odor from the fish factory was also a frequent answer. Other items mentioned included: too many restrictions, too secluded for safety, parking on the side of the road, the pump station, and the nuclear cooling system.

Public Facilities and Services

Property owners were also asked to respond to questions evaluating facilities and services in the community and financing mechanisms for future facilities and services. Specifically, they were asked to rate ten service/facility related items on a scale of one to five. One was the lowest or worst rating while five was the highest or best. In general, the ratings for town management, water prices, building inspection, zoning administration, fire and police protection were low. Only refuse service and water quality were rated high. Recreation, streets, and planning had ratings near moderate. Below is a tabular summary of the responses.

Item	Rating 1	2	3	4	5
Town Management	1	3	4	0	3
Water service-price	5	2	3	1	3
-quality	1	2	1	4	3

Item	Rating 1	2	3	4	5
Refuse Service	2	2	0	7	6
Recreation	2	1	2	2	2
Building Inspection	2	2	3	1	0
Zoning Administration	5	2	0	1	2
Planning	2	1	2	1	1
Fire Protection	4	3	4	1	0
Police Protection	4	3	5	2	0
Streets	3	1	6	3	2

Asked about additional or improved services they would like to see, property owners responded that something should be done about the erosion and litter problems. Improved police protection, however, was the most prevalent response.

In another question regarding how new public facilities should be financed (to accommodate future population increases), approximately 44 percent chose user charges/bond financing, 40 percent chose taxes, and 16 percent chose assessment of property owners.

Future Development

Caswell Beach residents were asked what types of development should be encouraged or discouraged. Most respondents agreed that permanent and seasonal residential, single family dwellings should be encouraged. Most respondents also agreed that multi-family dwellings, industrial, commercial, and tourist related businesses should be discouraged. Duplex development was the only item on which there was disagreement. The following is a list of different development types with the percentage of responses for encouragement or discouragement. Any percentages not accounted for in the table are due to "no response".

Type	Encouragement	Discouragement
Permanent Residential	94%	0%
Seasonal Residential	89	0
Single Family Dwellings	89	6
Duplexes	28	44
Multi-Family Dwellings	17	61
Commercial	11	72

Type	Encouragement	Discouragement
Industrial	6	78
Tourist-Related Business	17	72

Polluted Shellfish Areas

In reference to shellfish areas adjacent to Caswell Beach which were closed to harvesting because of pollution, property owners were asked what methods, if any, they would support to clean up these areas and permit harvesting. A total of 23 responses were given. Of these responses, "prevention of building near wetlands (within 75 feet)" received the most response (43 percent of total responses). This was followed by "construction of a sewage treatment facility (35 percent) and "increase lot size requirements for building homes" (22 percent).

Beach Erosion

The rate of beach erosion in Caswell Beach has been established by the State of North Carolina to be two feet per year. The State requires that buildings on the beach front should last about 30 years and that to accomplish this, a set back from the water of 60 feet must be required. Caswell Beach property owners were asked what they thought of this policy. Almost all of the respondents felt the policy should remain in effect and be enforced (16 responses). Only two respondents felt it should be cancelled, and a few felt that people should be allowed to build closer to the water, but not be allowed to get federal flood insurance if they do build closer.

In another question regarding the beach erosion problem, residents were asked what they would support that the Town of Caswell Beach do to help in beach renourishing projects. Fourteen responses were given for this question. These responses indicated support for helping to finance a portion of the project cost and providing legal access for work (6 responses each). Only two respondents indicated support for providing areas from which to take sand and places on which waste soils can be deposited. Others chose not to answer the question.

CP & L Canal

Noting that the CP & L cooling water canal has profoundly affected the appearance of Caswell Beach, the questionnaire asked property owners what they favored to be done about the condition. Twenty responses were given. Landscaping the canal pumping station had the highest response rate (55 percent). Next to landscaping, respondents favored that CP & L switch to cooling towers and abandon the canal (30 percent). A few favored that the canal station remain the same.

Beach Ordinance

Property owners were asked what policies they would favor for a Town beach ordinance. Responses indicated that residents would definitely not favor a policy of allowing off-road vehicles on the beach and dunes (17 responses). A majority of the respondents did favor a policy of establishing a limited number of access routes to the beach and restricting access along other portions of the beach (12 responses for, 5 against). And responses were split almost equally regarding the policy of providing a central parking area for beach visitors (8 responses for, 6 against).

Emergency Preparedness

One final question was asked of residents regarding how well prepared the Town of Caswell Beach was for hurricane evacuation. Seventeen percent of those who responded felt that it was not well-enough prepared, while 78 percent felt it was well-enough prepared. The remaining percent did not respond to the question or did not know.

3. SUMMARY OF MAJOR ISSUES AND PROBLEMS

The following list is a summary of current issues and problems facing Caswell Beach as indicated in the Citizen Questionnaire Report.

Issues

Net Fishing
Maintaining Low Taxes
Property Protection
Beach Being Too Secluded For Safety
Parking Along the Side of the Road
Nuclear Plant Cooling Water Canal
Duplex Dwelling Development
Clean-up of Polluted Shellfish Areas
Vehicles on the Beach

Problems

Erosion
Litter
Inadequate Police and Fire Protection
Oder From the Local Fish Factory

Areas Where Improvement is Needed

Water Service - Price
Building Inspection
Zoning Administration
Fire Protection
Police Protection
Beach Renourishment Projects

POLICY STATEMENTS
Caswell Beach

The Caswell Beach Town Council has adopted the following policies for dealing with land use planning issues which will affect the community within the next ten years. These policies establish a systematic basis by which proposed developments are to be judged. If a proposed project or development would violate the intent of these policies, action to prevent its construction will be taken by local, state and federal government agencies.

These policies are to be used by local officials in their decision making process to increase the consistency and quality of their decisions.

CASWELL BEACH
POLICY STATEMENTS

I. Resource Protection

I. Caswell Beach will support and enforce through its CAMA minor permitting capacity the State policies and permitted uses in the areas of Environmental Concern. The state policy statements for AEC's offer protection for Caswell Beach's fragile and significant environmental resources through the CAMA permitting procedures. In addition to those policies set forth in Subchapter 7H of the State CAMA Regulations, Caswell Beach adopts the following policies concerning (AEC's):

A. Coastal Wetlands. Activities in Coastal Wetland areas shall be restricted to those which do not significantly affect the unique and delicate balance of this resource. Construction in the Coastal Wetland will be permitted only as is necessary to provide access easements for those types of development activities that are water dependent. Such uses as docking facilities, fishing piers and utility easements will be permitted so long as they fulfill the requirements of other applicable laws. Substantial effort must be provided by the developer to disturb as little Coastal Wetland Areas as possible in the design construction and operation of any facility placed in a Coastal Wetland AEC.

B. Estuarine Waters. Caswell Beach, in recognition of the importance of Estuarine Water for the fisheries industries, shall promote the conservation and quality of this resource. Suitable uses of this land/water area are those which do not permanently or significantly affect the function, cleaniness, salinity, and circulation of Estuarine Waters. Permitted use in Estuarine Waters shall include access and navigation channels.

Caswell Beach, in recognition of the shellfish areas pollution problem which closed these areas to harvesting, will support the construction of sewerage treatment facilities as proposed by the Southeast 201 Facilities Plan.

C. Public Trust Areas. Caswell Beach supports the North Carolina State Policies concerning public trust areas as it is set forth in Subchapter 7H .0207, as stated below.

A. Management Objective. To protect public rights for navigation and recreation and to preserve and manage the public trust areas so as to safeguard and perpetuate their biological, economic and aesthetic value.

B. Use Standards. Acceptable uses shall be those consistent with the management objectives in (A) of this Rule. In the absence of overriding public benefit, any use which significantly interferes with the public right of navigation or other public trust rights which the public may be found to have in these areas shall not be allowed. The development of navigational channels or drainage ditches, the use of bulkheads to prevent erosion, and the building of piers, wharfs, or marinas are examples of uses that may be acceptable within public trust areas, provided that such uses will not be detrimental to the public trust rights and the biological and physical functions of the estuary. Projects which would directly or indirectly block or impair existing navigation channels, increase shoreline erosion, deposit spoils below mean high tide, cause adverse water circulation patterns, violate water quality standards, or cause degradation of shellfish waters are generally considered incompatible with the management policies of public trust areas. In every instance, the particular location, use, and design characteristics shall be in accord with the general use standards for coastal wetlands, estuarine waters, and public trust areas.

D. Estuarine Shoreline. Caswell Beach presently conforms to CAMA Regulations concerning Estuarine Shorelines. The Estuarine Shoreline is defined as those areas 75 ft. landward of the Estuarine Shoreline. Caswell Beach realizes the dynamic nature of the Estuarine system and continual interaction of Estuarine Waters and Estuarine Shoreline. The natural process of erosion transforms Shoreline areas in Public Trust Areas. It shall be the policy of Caswell Beach to allow this natural process to occur if life or structures are not in jeopardy.

On-shore development also has a profound effect on adjacent Estuarine Waters. Effluent from poorly placed or functioning septic systems can pollute most shellfish areas which represent much greater economic benefits to the County's citizens than do the residential use of Estuarine Shoreline Areas. In recognition of this fact, Caswell Beach discourages the use of Estuarine Shoreline Areas for residential purposes where there is a substantial chance of pollution occuring.

E. Ocean Hazard Areas. Caswell Beach supports the state policies for Ocean Hazard Areas as outlined in Subchapter 7H .0306 as outlined below:

A. Development will be permitted only landward of the crest of the primary dune. If no primary dune is present, development must be set back a minimum of 30 times the average annual erosion (a total of 90 feet at Yaupon Beach) from the first line of stable vegetation.

B. No development will be allowed that involves the removal or relocation of dune sand or vegetation.

C. Mobile homes shall not be permitted within high hazard flood areas unless they are within mobile home parks existing as of June, 1 1979.

D. Prior to development in an Ocean Hazard area, the developer or builder must give written acknowledgement of the risks associated with building in the AEC, and places no responsibility on the Coastal Resource Commission for any future damage.

Caswell Beach, in recognition of their beach erosion problem and their need for beach renourishment projects, supports the financing of a portion of the beach renourishment project cost, and also supports the provision of easements for work.

Caswell Beach supports an ordinance concerning the beach which would prohibit off-road vehicles on the beach and dunes, provide controlled beach access and specified parking areas. Such an ordinance helps control the erosion problem.

Caswell Beach supports the establishment of any programs designed to control the littering problems of the Ocean Hazard Areas.

2. Physical Constraints to Development.

Caswell Beach adopts the following policies relative to physical constraints to development.

A. Growth and development will be discouraged in areas where septic tanks will not function and sewer services are not available.

Many areas in Caswell Beach contian soils which do not permit adequate percolation necessary for septic system functioning. These areas are referred to as areas with very severe and severe soils. 75.6% percent of Caswell Beach's soils are very severe, and 2.8% percent are severe. The high percentage of very severe soils is partly due to the vast amount of undeveloped incorporated Coastal Wetlands. However, if percentages are developed using the developed portion of Caswell Beach, only % are very severe, and % severe.

Also, many areas have high water tables which similarily inhibit septic system functioning. These areas, as they are delineated on the soil suitability maps will be discouraged from being developed unless sewer service is available.

B. Growth and development will be discouraged where poor drainage exists. Corrective measures such as stilts will be required if construction is to be done in areas of poor drainage or seasonal high water.

Because Caswell Beach lies on the low Coastal Plain of the East Coast, flooding can cause substantial harm to property and life. In order to minimize this occurrance, Caswell Beach will discourage development in areas of seasonal high water. Only developments that cannot be placed in more suitable locations may be developed in areas which are susceptible to flooding. Examples of permitted uses in these areas are very low density residential use and golf courses. If residential or other low density "urban" use is to be developed in an area of drainage or seasonal highwater, special requirements such as stilts may be necessary.

C. Growth and development will be discouraged in areas where soils will not support buildings.

Where suitable alternative locations exist for a particular development project, Caswell Beach will discourage its location in an area where soils will not adequately support buildings. If no alternative sites exist, the project may be constructed if corrective measures to stabilize the building foundation are incorporated into the project design.

3. Special Local Development Issues

Existing C.P.&L. - Cooling Water Canal. Caswell Beach, in recognition of the negative aesthetic effect that the CP&L cooling water canal has had upon the Beach, supports a program to landscape the canal area.

II. Resource Production and Management

Caswell Beach's natural resources play a vital role in its economy. Caswell Beach's land is heavily utilized for private beach recreational use. Protection of these resources is a prime concern of Caswell Beach. To deal with issues that involve resource production and management, Caswell Beach adopts the following policies:

A. Productive Agricultural and Forest Lands. Caswell Beach contains no productive agricultural and/or forest lands. Furthermore, there will not likely be future agricultural and/or forest land use in Caswell Beach. Therefore, no policy statements concerning this issue will be made.

B. Net Fishing. Although Caswell Beach has a good deal of net fishing on its beaches, Caswell Beach actively discourages this activity. Many problems have been caused by the nets conflicting with the beach's recreational activities. Caswell Beach suggests that a set of rules and regulations for net fishing be developed and strictly adhered to. These rules would protect the rights of the fishermen as well as the beach front property owners and those using the beach for recreational purposes.

Caswell Beach feels that protection of Coastal and Estuarine Waters is a prime prerequisite. Habitats for shellfish in all portions of thier life cycle must be preserved in order to maintain fishing as a viable economic and recreational activity. Therefore, any development which will profoundly and adversely affect Coastal and Estuarine Water will be discouraged. In the design, construction, and operation of Coastal and Estuarine development, every effort must be made to mitigate negative effects on water quality and fish habitat. These efforts will be at the owners or operators' own expense.

C. Existing and Potential Mineral Production Areas. Caswell Beach contains very little known mineral deposits, none of which have ever been mined. Sand is the only deposit in abundance. Therefore, no policy statements concerning this issue will be made.

D. Off-Road Vehicles. Caswell Beach discourages any off-road vehicular traffic on the beaches or Estuarine Shoreline areas of Caswell Beach with the exception of those vehicles involved in emergency or rescue operations.

E. Airports. Obviously, no land within Caswell Beach is used or will be used as an airport. However, Caswell Beach is near the County Airport Approach zones. Residential development should be kept well away from airport approach zones and "runup" areas because of:

A. Noise
B. Crash hazards
C. Likelihood of industrial growth near the airport.

Since all three of these are likely to exert a detrimental effect on residences, the Federal Housing Administration will not insure home mortgages within defined areas around airports where these factors are present.

III. Economic and Community Development

A. The citizens of Caswell Beach believe that permanent and seasonal single family residential structures should be the most encouraged type of development within the town of Caswell Beach. Of the different types of residential uses, multi-family and duplexes have a lower acceptance level than do the permanent and single family residential uses.

B. Commercial development is also discouraged on any part of Caswell Beach outside of the one existing area zoned commercial at the north end of the Beach.

C. Industrial development of any type is discouraged in any area of Caswell Beach. These policies are supported by the Caswell Beach zonning ordinance.

D. Provisions of Services To Development

1. Caswell Beach will work to sustain sources of water for residential use as water in necessary for such development. It is Caswell Beach's responsibility to secure the sources of water for the public water supply. The cost of providing this supply will be borne by the users.

2. Caswell Beach presently provides water lines to all of its residential and commercial properties and recognizes that it is their responsibility to continue to provide this service to existing and all new residential and commercial development in the future. Individual connections will be done at the users' or property owners' expense.

3. Caswell Beach recognizes its role as the provider of solid waste disposal service for its residences. Caswell Beach is presently using County landfills as the means of solid waste disposal and will do so in the foreseeable future. In order to carry out this role, adequate means of final disposal must always be available. This may take the form of incineration, resource recovery, land application sites, or landfills. Adequate landfill sites need to be retained at all times. Caswell Beach is presently using the Southport Landfill on Rt. 211. Caswell Beach will support original landfill sites so long as Brunswick County retains maintained and guarantee landfill sites equal to the 20 year need of the project.

4. In a sparsely populated municipality like Caswell Beach, it is prohibitively expensive to provide fire protection and rescue services with paid professionals.

5. Caswell Beach will discourage the development of any commercial land use outside of the existing area designated by the Caswell Beach Zoning Ordinance.

6. Caswell Beach will discourage the development of any industrial use.

7. Caswell Beach will support the compact Growth Policy and the development of low density multi-family, permanent residential, seasonal residential, and low density single family dwellings through the compliance and enforcement of the Caswell Beach Zoning Ordinance.

8. Caswell Beach supports the development of properly located and planned facilities for mobile homes as outlined in the Caswell Beach Zoning Ordinance. It is recognized that mobile homes should be located in mobile home parks and subdivisions only, and that such areas must be carefully located and designed to meet the needs of the residents and to achieve a satisfactory relationship to adjoining and nearby property.

9. Caswell Beach has no school facilities within its jurisdiction. However, Caswell Beach will encourage continued and expanded multi-purpose use of the Southport school facilities for recreation and other purposes.

E. Growth Patterns

1. Caswell Beach will follow a "Compact Growth Policy". This policy will allow existing areas under development to develop fully before expansion into new areas and new development will occur as an expansion of existing fully developed areas.

2. Caswell Beach will in addition follow where applicable a policy of "Compact Growth within existing service corridors." This policy will allow existing areas under development and areas in existing service corridors to fully develop before expanding into new areas and new development will occur as an expansion from these fully developed areas.

3. Growth and development will be programmed to occur where adequate services are available or planned.

4. Caswell Beach's policy will be to discourage a large amount of growth and development and large increases in population.

5. Low density residential land use will be the only type of land use that will be encouraged in Caswell Beach.

F. Caswell Beach regards its quiet and family-oriented character as an asset and makes it the policy of Caswell Beach to promote their tourist industry with single family seasonal residential development only. Caswell Beach discourages the development of any tourist related business such as hotels or restuarants.

G. Compliance with Official Plans. Caswell Beach Supports the compliance with the following official plans:

1. THOROUGHFARE PLANS

Where a proposed subdivision includes any part of a proposed thoroughfare which has been designated as such in an officially adopted Thoroughfare Plan for the Town of Caswell Beach, all parts of such thoroughfare shall be platted by the subdivider in the location shown on the Plat and at the right-of-way width specified in this Ordinance.

2. ZONING ORDINANCE

Where a proposed subdivision is located in an area in which the Town Council of the Town of Caswell Beach has adopted a zoning ordinance and zoning map, said subdivision must comply in all respects with the requirements of the zoning ordinance.

IV. Continuing Public Participation

A. Caswell Beach will encourage its citizens to become involved in the land use planning process.

Caswell Beach realizes an important part of any planning program is citizen involvement. In order to provide for this public participation, Caswell Beach adopts the following public involvement policy.

(1) All land use plan and updates will be done with public participation.

Citizen participation in the land use planning process will be accomplished by utilizing the following plan:

1/3 I. Education
- A. Newspaper
  - 1. News releases
  - 2. Letters to editors
- B. Pamphlets
- C. Public meetings

1/3 II. Input
- A. Public meetings
- B. Surveys
  - 1. Mail
  - 2. Door to door
  - 3. Telephone
- C. Review and Comments
  - 1. Newspaper spread of plan summary
  - 2. Public review meeting

1/3 III. Support
- A. Use of education and input properly
- B. Public hearing (formal)

CASWELL BEACH

IMPLEMENTATION PLAN

IMPLEMENTATION STRATEGIES

In order to carry out the policies and goals which have been adopted by Caswell Beach , implementation strategies are needed. Strategies are specific tools such as systems of taxation, public expenditures, regulations and ordinances. These tools can be used to promote the policies of the City as well as bring it closer to its desired end state.

These strategies must be realistic in terms of the context in which they operate. To be appropriate, they must be politically viable and enforceable.

Caswell Beach has two local units of government which provide services to the city and have authority to levy taxes. These two units are: the City of Caswell Beach and Brunswick County. Historically, counties have been responsible for software services (i. e., health, education and welfare) while municipalities were responsible for hardware services (i. e., water, sewer, streets and sanitation). However with a changing demographic picture, both cities and counties have initiated services of both types. Coordination of services between Caswell Beach and Brunswick County are very few. However, agreements in several areas should be explored. Possible areas for joint services include recreation, and wastewater treatment.

The degree to which any of these service agreements can be achieved will be determined by the cost involved. The cost in turn can be held to a minimum by land use control. Caswell Beach has authority to regulate the use of land outside AECs and within its jurisdiction.

Caswell Beach has several implementation tools, which include a Zoning Ordinance, a Subdivision Ordinance, Health Department Regulations , Building Codes, a very-soon-to-be adopted Land Use Plan, A Land Classification Plan, a Sand Dune Protection Ordinance, and Cama Regulations. Following is a brief discription of each strategy and an explanation of how the strategy will operate to implement the policies and goals of Caswell Beach.

I. ZONING

Zoning is the enactment of a law by public authority that controls and regulates private property. Zoning consists of dividing the community into districts or zones and regulating within such districts the use of land and the use, height and area of buildings for the purpose of conserving and promoting the health, safety, morals, convenience, and general welfare of the people of the community. A County or town can be divided into any number of districts. Each district will have its own permitted uses, yard size, lot size and height requirements. All pieces of property within one district must be treated and regulated equally.

A zoning ordinance consists of two things: (1) The Text which contains definitions, descriptions of the districts in terms of permitted uses, lot size, yard requirements, etc. Also the text contains information about procedures to get a building permit, a variance or special exception to amend the zoning ordinance. (2) The Zoning Map which shows how the community is divided into districts.

Special Use or Special Exception

Within one district, certain uses may be permitted with special requirements attached. For example, within a residential zone, houses are permitted and must only meet the standard requirements of that residential zone. They must have a minimum lot size, yard dimensions and building requirements. A convenience store may be permitted in that residential district only if certain other requirements are not met as well. This special use might require that the convenience store provide landscape buffer strips, a parking lot, a larger lot, etc.

Using the special use approach, certain possibly conflicting uses may be permitted within districts so that their negative impacts are reduced.

Variance

A variance is a permit which allows a property owner to use property in a way that the zoning ordinance restricts. A Variance is a provision to insure that persons are not seriously injured by the use of the Zoning Ordinance. It is a recognition that no law is perfect and thereby provides a means to reduce misjustice. The Board of adjustment can grant a Variance if three findings can be made:

1. There is a practical difficulty in complying with the ordinance or that strict adherence to the ordinance would cause undue hardship. Five things must be proved by the applicant to show practical difficulty.

   A. If the property owner does comply with the ordinance, he can make no reasonable return on his property.

   B. The hardship results from the ordinance itself.

   C. The hardship must be suffered by the lot and not the owner.

   D. The hardship cannot result from the property owners own action. For example if he had subdivided his lots to small to comply with the Zoning Ordinance.

   E. The hardship must be perculiar to the individual property.

2. The Variance must be in harmony with the general intent of the Ordinance. If the variance would cause a significant change in the character of neighborhood, the variance should by denied.

3. The public safety and welfare must be assured. If the granting of the variance would cause a dangerous situation, such as high traffic volume on a neighborhood street, the variance should be denied.

Enforcement of the Zoning Ordinance

The enforcement of the Zoning Ordinance is the responsibility of the zoning administrator or building inspector. His duties are to issue building permits and inspect property for violations.

When a person applies to the building inspector for a permit, the inspector determines if the porposed use and site layout is in compliance with the Zoning Ordinance. If it is not, the permit is denied. The inspector also checks his jurisdiction for violations. If he finds a building is being erected without a permit, a stop-work order will be issued. A fine may then be imposed.

Importance of the Zoning Ordinance

The importance of a zoning ordinance for Brunswick County is evident. As the population of the Southport Area increases, conflicts in land use begin to emerge. Factories may locate too close to neighborhoods. Mobile homes may invade a previously all single family-home neighborhood. A strip of commercial development along a major highway may cause traffic congestion and accidents. A zoning ordinance can prevent these events. It can alleviate sprawl problems by zoning areas within and immediately adjacent to developed areas at a higher density than outlying areas. The greater use to which land can be put will encourage development there. Zoning can be used to protect natural and recreational resources. The coastal and estuarine waters are a major source of recreational activity. Dense development near these areas can pollute the waters from runoff. Near these areas, zoning can prohibit high densities and industrial development which may harm the fragile environment.

II. SUBDIVISION REGULATIONS

Subdivision regulation fosters planned and orderly development of the land in the Southport planning area. It determines efficient methods for the integration of proposed subdivision streets with existing and planned streets. Provisions for the dedication of street right-of-way and utility easements and for the planned arrangement of streets and structures that will enable the City to avoid overcrowding and congestion are included in the regulation. Such an ordinance has the general purpose of regulating land within the city limits and the extraterritorial jurisdiction in order to preserve the public health, safety, and welfare.

Variance

A variance to the ordinance may be granted if strict adherence to the regulations would cause unnecessary hardships or where topographical or other conditions peculiar to the site and a departure from these regulations will not destroy their intent.

Enforcement of Subdivision Regulations

The enforcement of the Regulations is the responsibility of all permit-issuing administrative agents or departments of the City of Southport. Their duty, aside from issuing development permits, is to determine if the proposed subdivision plan is in compliance with the Subdivision Regulations Ordinance. If it is not, the permit is denied.

Enforcement is also a responsibility of the Brunswick County Register of Deeds who shall not file or record a plat of subdivision located within the territorial jurisdiction of the Cith of Southport without approval of the legislative body as required in the Ordinance. That body is to determine if the proposed subdivision plan is in compliance with the Regulations.

Importance of Subdivision Regulations

The regulations establish general requirements and design standards for development regarding suitability of the land, different types of developments , public facility/service areas, existing and planned streets, and community amenities. Standards for street design, lot size, buffer strips, and easements are also established.

The regulations are designed to insure an adequately planned street system and to avoid sharp curves, hazardous intersections; to avoid overcrowding of the land and extreme concentrations of the population; to secure safety from fire, panic, and other dangers; to provide for adequate water and sewage systems, schools, recreational facilities, to facilitate an orderly system for the use of land; to insure the proper legal description and monumenting of subdivided land; and to provide for the resubdivision of large land parcels.

III. Land Use Plan- Caswell Beach is in the process of developing and adopting a Land Use Plan for 1980-1985. On the municipal level the Land Use Plan may be used in the day to day business and in planning for the future. Oftentimes, the land use plan guides in local policy decisions relating to overall community development. The plans also provide the basis for development regulations and capital facility planning and budgeting. By delineating how the community wishes to grow, the land use plans help to assure the best use of tax dollars as public utilities can be extended to the best areas for growth.

IV. LAND CLASSIFICATION PLAN

The general land classification system was developed by the State of North Carolina to help counties and municipalities in the implementationof their goals, objectives and policies. The use of the land classification system and map is strategy which will promote the orderly use of land within the city. By delineating land classes on a map, the local government can specify those areas where certain policies will apply. Identification will be made of the future use of all land in the Southport area. The designation of land classes allows the local government to identify the use, and density of each area, and hereby plan for public services to service those areas. The land classification system and map will be used as a base to formulate more formal and regulatory tools such as zoning.

The state and the Federal Government utilize the local land classification syatem and map to determine whether projects and development which requires government license, permits or funds will be permitted to locate in the Southport area. If the proposed project is inconsistent with the land classification at its proposed location, the permit, license or funds will be denied.

One of the objectives the State of North Carolina has set for local government in the land use plan update process is the further examination and refinement of the land classification system. In keeping with that objective, a land classification plan has been developed for Caswell Beach.

V. HEALTH DEPARTMENT REGULATIONS

The Brunswick County Health Department, under the authority of a resolution passed by the Brunswick County Board Health, has the responsibility of administering the rules governing the protection of private water supplies, the rules governing public water supplies, and the laws and rules for ground absorption sewage desposal systems of 3000 gallons or less design capacity, of which were enacted by the authority of the North Carolina General Statues.

VI. BUILDING CODE

A building code is a law which requires that minimum, standards, provisions, and requirements are met for safe and stable design, methods of construction and uses of materials in buildings and/or structures erected, constructed, enlarged, altered, repaved, moved, converted to other uses or demolished and to regulate the equipment, maintainance, use and occupancy of all buildings and for structures.

The general purpose of a building code is to promote the public health, safety, and welfare. The state of North Carolina provides a standardized building code which is very comprehensive and insures that all buildings are adequate and safe. All local governments in North Carolina will be required to adopt this code by 1983 and enforce it with a building inspections department. The local government code may deviate fro the State Building Code only if a compelling need can be proved.

Caswell Beachcan use the North Carolina Building Code to improve the quality of construction within the planning area. Many buildings and homes are substandard and do not provide adequate shelters for dwellings, businesses, or other uses.

A building inspector enforces the Building Code. The Building Inspector's responsibilities consist of several things. First, he accepts applications for building permits. No structure can be legally erected without such a permit. The application contains drawings of the proposed building which will allow the Inspector to determine if the building meets the coldes' standards. The Building Inspector also inspects buildings to ensure that the construction is occurring in accordance with the approved specifications. Condemnation of unsafe buildings is also a responsibility of the Inspector. There are less rigid standards that must be met by existing buildings as opposed to new construction.

VII. CAMA Regulations

Development standards have been established for Areas of Environmental Concern. They serve to protect and to conserve the natural functions of the AEC's (See standards under Fragile Areas).

Enforcement of CAMA regulations

CAMA requires that each town desiring to develop its own Land Classification Plan and Implementation Plan to identify a "designated local official" to review, process, and issue permits for use of AEC's.

VIII. Sand Dune Protection Ordinance

The Brunswick County Commissioners have adopted the "Sand Dune Protection Ordinance of Brunswick County" the purpose of which is " . . . . to preserve and promote the protection of the outer banks of Brunswick County . . . .". The areas in which this Ordinance applies includes all of the "barrier" islands on the southern boundary of the County including the Towns of Sunset Beach, Ocean Isle Beach, Holden Beach, Long Beach, Yaupon Beach and Caswell Beach as well as Bald Head Island, Battery Island, Striking Island and Bird Island.

Under this Ordinance a permit is required in order ". . . to damage, destroy or remove any sand dune or part thereof . . . or to kill, destroy or remove any trees, shrubbery, or other vegetation growing on sand dunes . . . ". These permits are issued by the County CAMA Permit Officer who is employed by the County on a full time basis. Permits will not be issued ". . . unless said action will not materially weaken the dune or reduce its effectiveness as a means of protection from the effects of high wind and water . . .". As indicated, this ordinance applies in both incorporated municipalities as well as unincorporated areas of the County.

IX. Principals and Standards for Future Development

A set of principals and standards for development has been established for the Caswell Beach area. A principal is a general idealized relationship between a land use and the surrounding land and people. Standards are specific measurement units used to quantigy the terms appearing in the statement of principals. They are not absolute, but, rather, are guides to be followed under average circumstances.

The Caswell Beach Town Council should refer to these in order to consistantly and retionally review development proposals in and around Caswell Beach. These principals and standard form the basis of land use regulations. In the case that a proposed development or some aspect of a proposed development is not covered by a law or ordinance, these principals and standards can be used by City officials as a foundation for negotiation with developers.

X. Maintaining a Low Tax Rate

The City of Caswell Beach can benefit from a low tax rate in several ways. First, a low tax rate will prevent excessive burden on low and moderate income persons and thereby allow them to care for themselves.

Maintenance of a low tax rate can be accomplished in several ways. First, user charges and special assessments can be utilized to finance construction of public facilites instead of tax money. This will firce those persons who directly benefit from public services to pay for them. Second, an increase in the tax base will reduce the tax rate. Finally, City expenses can be kept at a minimum. A growing municipality needs many services, but there are means to reduce costs. The zero-based budgeting concept can be used to prevent the perpetuation of unneeded jobs expenses. Normally, departmental budgets that are reviewed in comparison to last's year's budget are not questioned. In zero based budgeting, all expenses in the budget are questionable. Extensive justification for each item in the budget is necessary for its approval.

PART 3: LAND USE SURVEY AND ANALYSIS

CASWELL BEACH

LAND USE SURVEY AND ANALYSIS

Introduction

In March of 1980 the Brunswick County Planning Department completed a land use survey of Caswell Beach. Before this date, no previous data was collected or recorded to compare with to determine acreage and land use increases and decreases as indicators of development trends and land use compatability relationships.

The 1980 land use survey serves four major functions: First, an accurate dwelling unit count is made available. Second, existing acreages for each land use category are determined. Thirdly, the designation of each parcel of land is given. From this process land use compatability relationships are determined. Fourth, and most important, the land use survey serves as the basis for an in-depth land use analysis. It will reveal, for example, the amount of unused but usable land available within the Town. This is an important consideration in shaping policies in matters of commercial and residential development, subdivision control, of facilities provisions and needs assessment and in the future, the establishment of zoning districts. The following analysis will deal primarily with the use of the land and the relationships of the various types of land uses.

I. Existing Land Use

There are approximately 2,637 acres of land and water within the corporate limits of Caswell Beach. Seven hundred fifty acres are covered by water. Of the total acreage, only 131.55 acres are developed. Developed acreage in Caswell Beach includes the following land use categories: Permanent Single Family; Seasonal Single Family; Commercial; Recreation; and Transportation, Communication, and Utilities. These developed acres account for 6.97% of total land acreage (without water acreage) and 4.99% of total surface area (with water acreage). The following chart details total acreage and percentage of each existing land use.

A. Residential Land Use

The amount of land used for residential purposes includes 39.2 acres or 29.7% of the total developed acreage. The nature of this residential land use is primarily if not entirely single-family development. A majority of these homes are seasonally occupied (75%), while 25% are year-round owner occupied. Although there are small concentrations of permanent dwellings, in general both permanent and rental homes are scattered the length of the beach. All of the 91 residential structures could be classified as sound. There are no mobile homes in Caswell Beach.

B. Commercial Land Use

Commercial Land Use accounts for .47 acres, or .36% of total developed acreage, the lowest percentage of use in Caswell Beach. The Oak Island Country Club is the only enterprise classified as commercial land. There are none of the stores, motels, or tourist ships often associated with beach communities at Caswell Beach, and with their present zoning ordinance, none are expected.

C. Recreational Land Use

The largest percentage of developed acreage (56.3%) is in recreational use. The total 74.1 acres are comprised of the golf course and tennis courts belonging to the Oak Island Country Club.

D. Transportation, Communication and Utilities

Included in this land use are the water pumping station near the Baptist Assembly and all streets and roads. Combined, there are 17,8 total acres in this classification, or .06% of total surface acreage.

E. Vacant and Undeveloped Land

This category is not really a land use per se, but does consist of the largest amount of land in Caswell Beach. Undeveloped land accounts for 1,755.13 acres or 93.0% of total land in the Town. Much of this land is not suitable for development, since it includes large amounts of coastal wetlands.

2. Development Trends

A. Major Problems Resulting From Unplanned Development

Often, small and inadequate lot sizes can occur when there are great development pressures on a city of small size such as Caswell Beach. This problem is complicated when the dwelling units on these lots are without sewerage facilities other than septic tanks. Serious problems may develop in the near future unless adequate services are provided to these areas of Caswell Beach that are rapidly developing.

B. Areas of Environmental Concern

Caswell Beach's primary assets are natural resources. Many of these resources are classified as Areas of Environmental Concern by the Coastal AREa Management Act of 1974 in an effort to preserve and protect them.

Of the AEC's designated by CAMA, Caswell Beach contains the following: Coastal Wetlands, Estuarine and Public Trust Waters, Ocean Beaches, Renewable Resource Areas, and Natural Hazard Areas. For a detailed description of these areas, see the section entitiled "Fragile Areas".

Development has been primarily in the Ocean Beach area where extensive erosion problems have occurred to the point that some development is in danger.

C. Existing Platted Lots

Because large amounts of estuarine waters and coastal wetlands are within the corporate limits of Caswell Beach, the percentage of platted acreage is extremely small. Although there are 169.8 acres of platted land, they comprise only 9.0% of the total land acreage. The other 91.0% of land acreage is unplatted and a large portion of it is not suitable for development. The average lot size in Caswell Beach is .44 acres, not including recreation, which is a slight bit larger than most beach communities. All of the lots are served by public water, but none are presently served by public sewer.

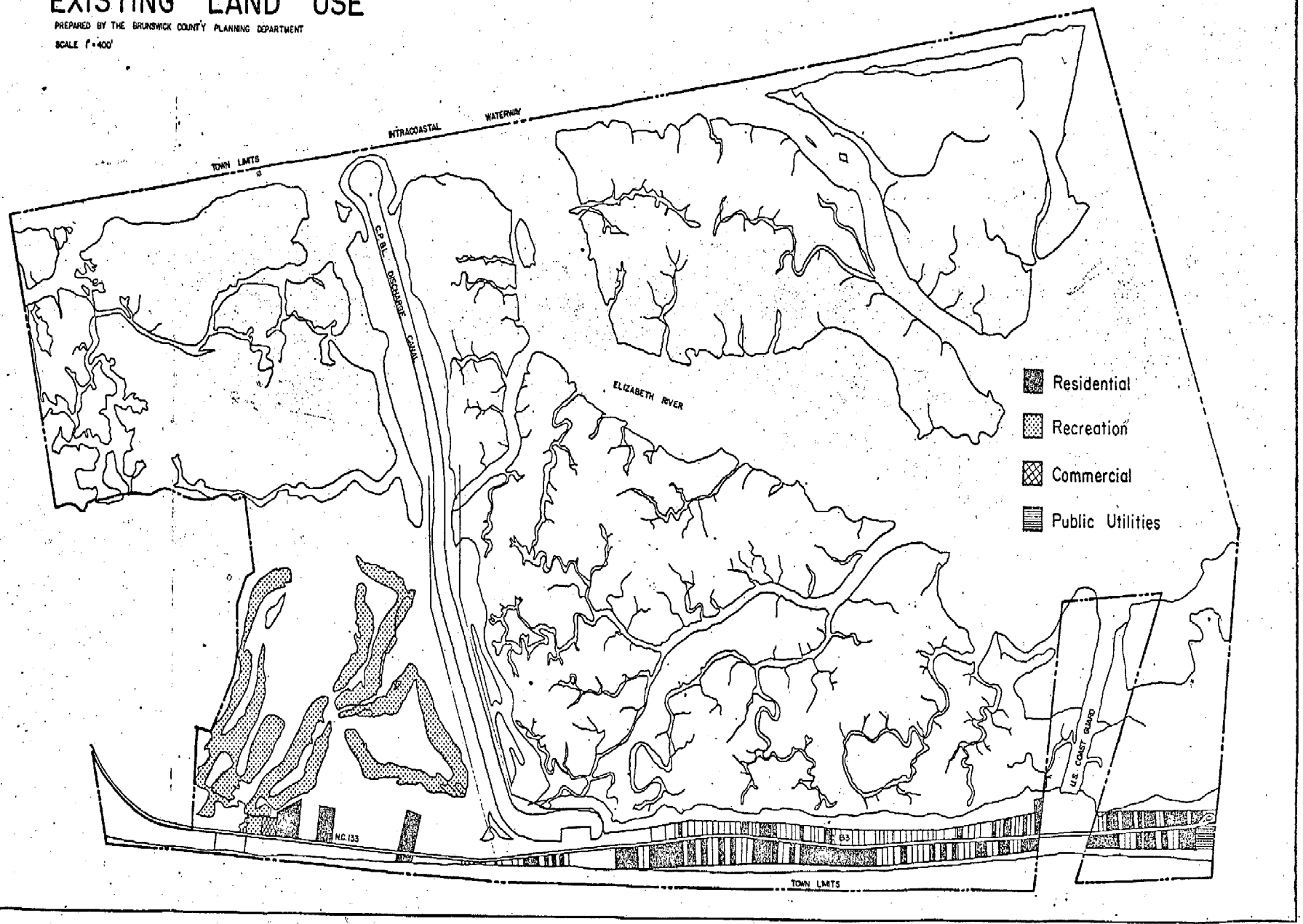
Caswell Beach Existing Land Use

Land use	Approximate Number of units	Average Acreage Per unit	Total acreage	Percentage of developed acreage	Percentage of Land Acreage	Percentage of Total Acreage Inculding Water
Permanent Single Family	22	.57	12.56	9.54	.67	.47
Seasonal Single Family	69	.38	26.62	20.24	1.41	1.01
Commercial	1	.47	.47	.36	.02	.02
Recreation	N/A	37.05	74.10	56.33	3.93	2.81
Transportation, Warehousing, Communication & Utilities	N/A	N/A	17.80	13.53	.94	.68
Subtotal	92	1.43	131.55	100%	6.97%	4.99%
Undeveloped Platted Acreage	N/A	N/A	38.30	N/A	2.03	1.45
Undeveloped Unplatted Acreage	N/A	N/A	1716.83	N/A	91.00	65.12
Subtotal	N/A	N/A	1715.13	N/A	93.03	66.57
Water	N/A	N/A	749.90	N/A	N/A	28.44
Subtotal	N/A	N/A	2505.03	N/A	93.03%	95.01%
Total	92	1.22	2636.58	100%	100%	100%

CASWELL BEACH
EXISTING LAND USE

PREPARED BY THE BRUNSWICK COUNTY PLANNING DEPARTMENT

SCALE 1"=400'



3. CASWELL BEACH EXISTING AND PROPOSED FACILITIES

The location of existing and proposed facilities has a substantial affect on where future growth will occur. By determining the location of proposed facilities such as water, sewage, and highway improvements, new growth destined to occur in these areas can be better planned. The following Facilities Map for Brunswick County illustrates ecisting and proposed water lines, sewage service areas, and transportation facilities as they apply to Caswell Beach.

Water Facilities

Caswell Beach has recently tied into the Brunswick County's Water system. Construction for an extension of the County's operating Phase I system from Yaupon Beach to Fort Caswell along N.C. 133 has been completed.

The Phase I water system consists of a well field, water treatment plant, elevated storage, and high service mains to distribute water to municipal and industial customers. The capacity of the existing water treatment plant is being expanded from 4.5 mgd to 6.0 mgd to provide for future industrial requirements of the system.

Based on this 1990 peak week population projection, the system will be capable of supplying the coastal areas with the following quantity daily during the 12 week summer season.

45,000 people X *gpd/capita = 4,500,000 gpd

* Includes commercial demand.

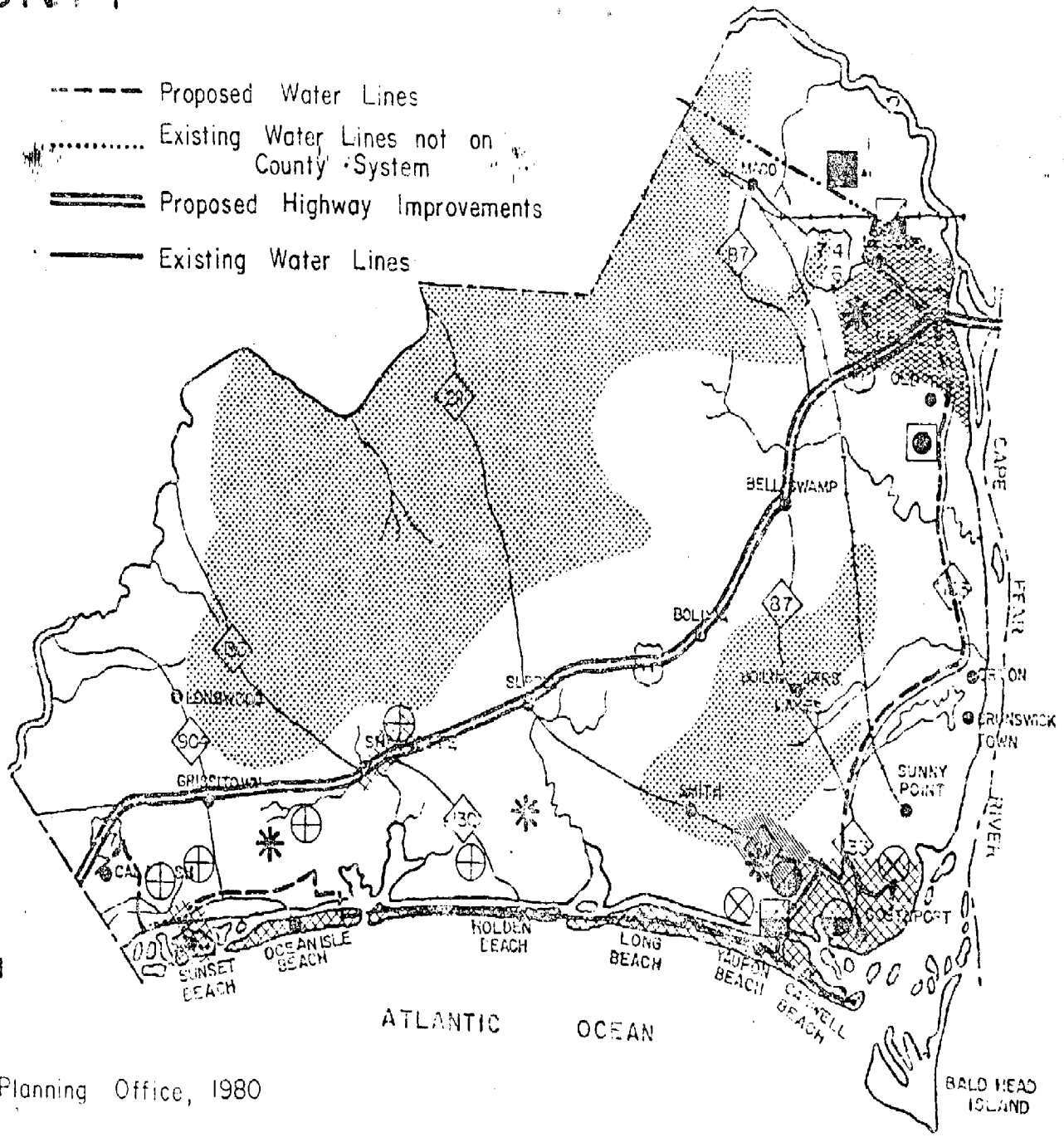
Sewage Facilities

For Caswell Beach, where most of the land area is not densely populated, the principal method for disposal of human and domestic wastes in rural and transitional areas outside these densely populated communities is the standard septic tank and filter field system. In the rural and community areas where low densities and suitable soils are present, such septic tank and filter field systems offer adequate sewage disposal without serious repercussions. However, in small towns and residential subdivisions with small lot sizes and high occupancy rates, the effectiveness and safety of septic tank disposal systems is significantly reduced by a smaller filter field dictated by the size of the lot.

BRUNSWICK COUNTY
NORTH CAROLINA

FACILITIES MAP

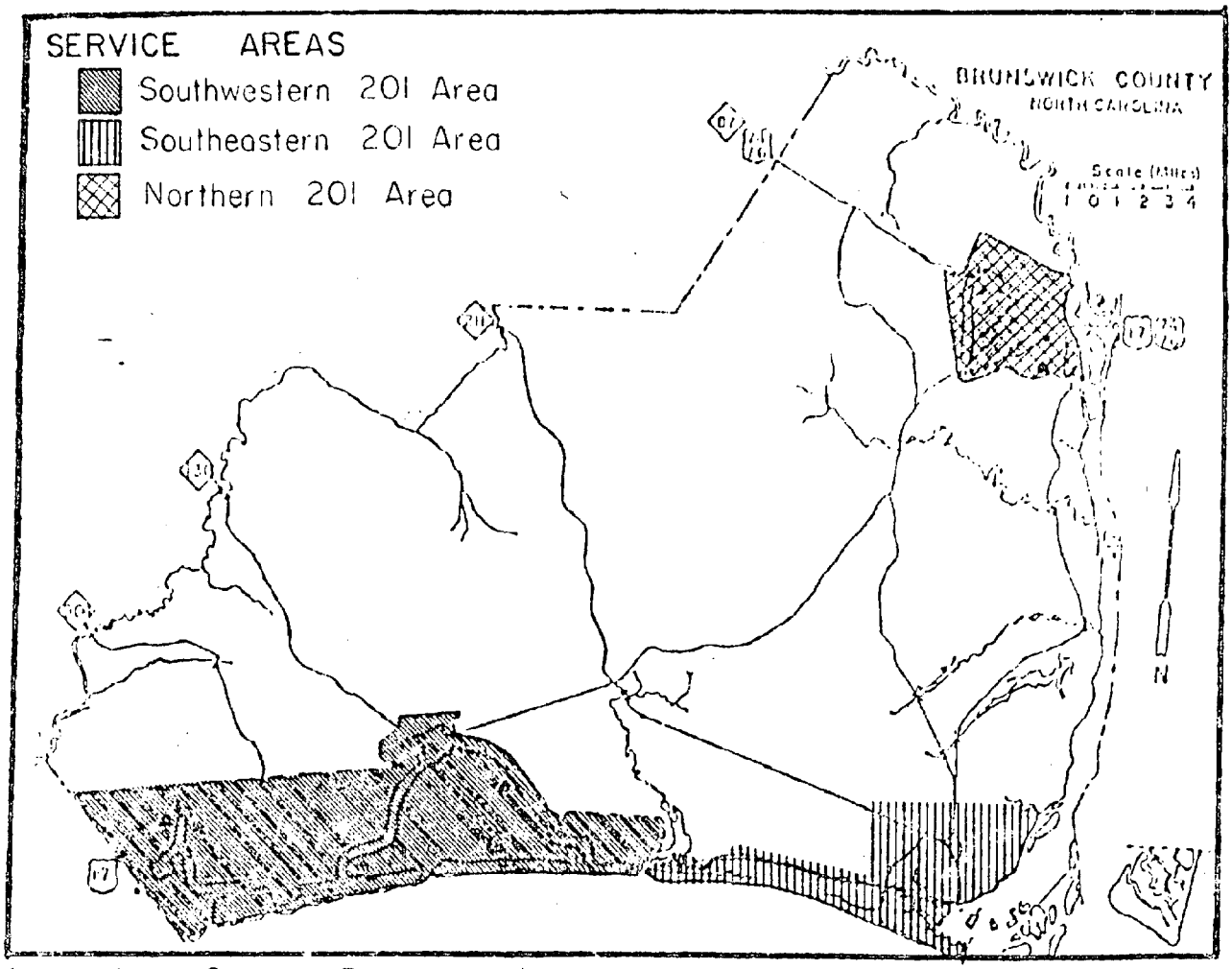
- Proposed Reservoir
- Proposed Water Treatment Plant
- Proposed Sewage Treatment Plant
- Proposed Pump Station
- Existing Water Treatment Plant
- Existing Sewage Treatment Plant
- Land Application Sites
- Existing Water Tanks
- Existing Landfill Sites
- Aquifer
- Leland Sanitary District
- Proposed Sewerage Service Area
- Existing Well Field
- Lower Cape Fear Proposed Raw Water Line
- Proposed Water Lines
- Existing Water Lines not on County System
- Proposed Highway Improvements
- Existing Water Lines



Prepared by the Brunswick County Planning Office, 1980

In order to accommodate future development, minimize the possibility of septic tank failure and thus public health problems and adverse financial impacts, and to minimize the shellfish areas pollution problems, Caswell Beach has been included in the Southeastern Brunswick County 201 Facilities Plan. The proposed Phase I (1990) and Phase II (2000) facilities will service 100% of Caswell Beach. The Phase I facility can serve a summer population of 1,446 and a winter population of 86. The total flow capacity for Caswell Beach will be 135,201 gpd (summer) which will more than adequately serve the needs of Caswell Beach.

The plan selected for wastewater management in Caswell Beach includes the collection and transmission of all wastewater generated within the sewered portions of the planning area to a wastewater treatment plant located northeast of the City of Southport. This facility, to be constructed on a 25-acre site near the Pfizer Chemical Plant, will utilize the oxidation ditch treatment process prior to discharging treated wastewater through a diffused outfall system to the main channel of the Cape Fear River. The purpose of such a system is to achieve a desired level of service at the lowest practical cost.



Brunswick County Planning Department, 1980 cpb

Caswell Beach is included in the Southeastern 201 Planning Area

PART 4: LAND CLASSIFICATION DEVELOPMENT

CONSTRAINTS ON DEVELOPMENT

Table of Contents

I. INTRODUCTION

An analysis was made to determine the suitability for development of all undeveloped lands in Caswell Beach. This consisted of three major mapping schemes which are as follows:

1) Soil limitations and productive lands
2) Lands with severe restrictions for development
3) Land suitability

These three schemes were analyzed and mapped, based upon the best information available. The major purpose of this analysis was to identify those areas in Brunswick County that have major constraints on development and to better educate the public of these areas before the Land Classification maps were drawn.

1). The first scheme deals with the general soil conditions in Caswell Beach and how the natural soil properties present certain restrictions on development.

2). The second scheme further breaks down the soil conditions into those areas where septic tanks will not function and development should not occur unless public sewer service is available. This mapping unit combines those soil associations which are sandy , poorly drained, and have relatively high water tables. Included in this analysis are those areas where septic tanks function but where deep sands have fast percolation rates causing contamination to nearby water wells. Since this pollution problem has a high probability of occuring, development within these areas should not occur unless either public water or sewer systems are available. Essentially these areas will be water quality limited areas if present patterns of growth and development continues.

The other division illustrates lands within the City where no development should be allowed. These include a) coastal wetlands; b) ocean beaches; c) frontal dunes and d) fresh water marshes. All of these soil types were given very severe soil ratings and are not further distinguished from one another on the soils map.

3). The last analysis scheme deals with land suitability showing those areas where future growth should not be programmed to occur because of various natural and man-made conditions.

The first breakdown deals with fragile areas which could be easily destroyed or damaged by inappropriate or poorly planned development These include:

1) Coastal Wetlands
2) Frontal Dunes

3) Ocean Beaches and Shorelines
4) Complex Natural Areas
5) Wetland Wildlife Habitats
6) Fresh Water Marshes

The second division illustrates the location of man-made hazards and zones. In this division the CP&L cooling canal is identified because of its rapid currents.

The third division of this analysis identifies natural hazard areas. These consisted of those areas that have high rates of erosion at the present and in the past and could be considered hazardous to development and certain other land uses. These areas are ocean erodible areas.

The fourth division of this analysis identifies those areas of archeological value. The location of Caswell Beach's one archeological site is marked to serve as a reminder of their important cultural value. No legal restrictions actually exist in most of these sites, but it is recommended that they be avoided or carefully preserved in the development processes. Most of such sites are those that are recognized by the State, however, it is felt that there are many more that are merely unknown to the State.

II. SOIL SUITABILITY ANALYSIS

Introduction

This is an analysis of the general suitability of Caswell Beach's soils for use as future sites for development. All of the Town's soils are classified as having some degree of physical limitations for future development. This analysis uses a general site map of the City and locates those soil associations with natural properties that are not well suited for development. The analysis discusses each soil and its interpretation. This analysis is essentially a guide and aid in the preparation of a land classification map. The maps and analysis are useful guides in planning residential growth, engineering works, recreational facilities and community projects. This is not a suitable analysis for planning and management of a specifiec residence or lot, or for selecting exact locations for building roads, etc., because the soils in any one association ordinarily differ in slope, drainage, depth and other characteristics that could affect their management.

The Outer Banks S.C.S. Soil Survey was used to develop the soil analysis sections for each association. The soil productive areas were identified by following certain established criteria. Agricultural lands were mapped according to capability class ratings from the S.C.S. which is explained in the text. Productive forest lands were separated according to the site index of the associations with only those of high value being mapped. Loblolly pine was used as the reference species.

Soil Conditions

This section of the report groups together various soils associations having similar soil properties and thus interpretes their natural soil condition as having either resource potential or specific development limitation. The soil ratings are determined on this basis. Such interpretations encompass certain established tests to each soils physical and chemical properties. They are as follows:

1) Soil Horizons- depth in inches of the major soil strata from surface to subsurface soils. This is used to determine relative depth to water table and the soils chemical properties.

2) Texture- based on the relative amounts of sand, silt, and clay in a soil, giving rise to testured classes such as sand, sandy loam, loam, clay loam, and clay.

3) Particle Size- based on the single soil unit and relates to shrink-swell potential, plasticity, and bearing capacity.

4) Permeability- that quality of a soil that permits the movement of water and air. Estimates of the range of permeability is the rate of time it takes for downward movement of water in the major soil layers when saturated, but allowed to drain freely.

5) Soil Structure- the arrangement and compaction of individual soil particles into the basic soil building blocks.

6) Available Water Capacity- the ability of soils to retain water for plant use.

7) Soil Reaction or ph- the degree of acidity or alkalinity of a soil.

Suitability Map Key Caswell Beach

Source: Soil Survey of the Outer Banks, North Carolina, Part I.

United States Department of Agriculture Soil Conservation Service in cooperation with North Carolina Department of Natural and Economic Resources and North Carolina State University Soil Science Department, June 1977.

The soil types indicated on the soil map were rated for bearing capacity and septic tank filter field capacity. Bearing capacity is a soil limitation rating for dwellings based on soil properties that affect foundations. Considerations are also made of slope, susceptibility to flooding, seasonal high water table, and other hydrologic conditions in rating the soils. Septic tank filter field capacity is a rating based on soil properties that limit the absorption or treatment of effuent. These properties include: slope, susceptibility to flooding, presence of a seasonal high water table, and permeability of the subsoil and underlying material. Past performance of existing filter fields is also important in determining the suitability of a site for the installation and design of a ground absorption sewage disposal system.

Each rating has a different meaning. These are indicated below.

Slight: Soil properties are generally favorable for the stated use, or limitations are minor and can be easily overcome.

Moderate: Some soil properties are unfavorable, but limitations resulting from the properties can be overcome or modified by special planning, good design, and careful management.

Severe: Soil properties are unfavorable and resulting limitations are too difficult to correct or overcome. Soil will require major soil reclamation or special design for stated uses. This rating, however, does not imply the soil cannot be used.

Very Severe: This rating is a subdivision of the severe rating and has one or more features so unfavorable for the stated use that the limitation is very difficult and expensive to overcome. Reclamation would be very difficult, requiring the soil material to be removed, replaced, or completely modified. This rating is confined to soils that require extreme alteration and, generally, are not used for dwellings and septic tank filter fields.

Coastal Floodplain is defined as the land areas adjacent to coastal sounds, estuaries, and the ocean that are prone to flooding from storms with an annual probability of one percent or greater (100-year flood). Land uses in these areas must comply with standards of the Federal Insurance Administration. These standards are associated with the following flood zone designations accepted by the Administration.

Flood Zone A - are those areas of 100-year flood.

Flood Zone B - are those areas between the limits of the 100-year flood and 500-year flood areas.

Both Zones A and B have been designated on the Caswell Beach Suitability Map.

The CAMA Areas of Environmental Concern for Caswell Beach include Coastal Wetlands, Estuarine and Public Trust Waters, and Natural Hazard Areas of sand dunes, ocean beaches and shorelines, and coastal floodplains. (See map and text for Fragile Areas of Caswell Beach).

Soils in the Slight Category:

Kureb fine sand

The soils are sandy and excessively drained. Permeability is rapid and available water capacity is very low, with a seasonal high water table below five feet. The soils are acid throughout, and are found on the penninsulas between the Intercoastal Waterway and the dunes. Depth to high water table is about six feet.

Wando fine sand

The soils are sandy and excessively drained. Runoff is slow, while infiltration and permeability range from rapid to very rapid. The seasonal high water table depth is usually greater than five feet. Found on the higher ridges and flats on the sound side of the barrier islands, these soil areas are commonly too far from the ocean to receive large amounts of sea spray.

Newhan fine sand

The soils are sandy and range from well-drained to excessively drained, often experiencing drought conditions. Water percolation is very rapid through the stratified sandy deposits that range from fine to coarse sand with varying amounts of shells. Typically found in long ridges on dunes parallel to the ocean, the soil areas are subject to salt spray and blowing sand. Depth to high water table is about six feet.

Soils in the Moderate Category:

Newhan-Corolla complex

The soils consist of two dominant types, Newhan and Corolla, which occur in an interrelated pattern on the landscape. Often this complex type occupies the transitional zone between the higher-lying dunes to the east and the broad flats to the west, consisting of low dunes and intervening basins that separate the dunes.

Newhan soils are well to excessively drained, dry, and have a low natural fertility. There is a thin surface layer low in organic matter and plant fiver. Sand is coarse and contains varying amounts of shell fragments. The water table is more than seven feet below the surface.

Corolla soils are moderately well-drained and sandy throughout, containing a high percent of coarse sand with varying amounts of shell fragments. Typically, the water table is within 15 to 20 inches of the surface.

Soils in the Severe Category:

Dredge Spoil

The soils are composed primarily of sand and shells. They are generally dry with rapid permeability. Located along the Intercoastal waterway, the spoils are a result of dredging maintenance of the waterway. Most of the areas are less than ten feet in height, and have been deposited on marsh. Depth to high water table is generally three feet.

Madeland

The soil is primarily sandy, but some areas contain up to 10 percent shells. Permeability is rapid and most areas are quite dry. Flooding by sea water is rare. The water table fluctuates with changes in tide level; however, most areas have a depth to the water table of about two to four feet during high tide. Found on the sound side of the island adjacent to the water. The soils has been dredged during the construction of canals and has been deposited between canals for use as building sites. Essentially, all of the material has been deposited over marsh and its average thickness ranges from three to six feet.

Soils in the Very Severe Category:

Beach-Foredune Association

The soil area includes both the beach and the "frontal dune." The Beaches are flooded daily by tidal action and contain sand ranging from fine to very coarse with varying amounts of shell fragments. The foredune portion consists of a dune just landward and parallel to the Beach. It is subject to severe erosion by wind and wave action in the absence of vegetation. Permeability is rapid for both areas and the depth to high water table ranges from zero to three feet on the beach and up to six feet at the foredunes.

Bohicket soils

The soils are clayey and very poorly drained. They occur in tidal marshes where rivers and streams empty directly into the ocean. Flooded daily by sea water, the soils are continuously wet, soft, and viscous. Depth to high water table is generally zero to three feet.

Leon fine sand

The soils are sandy throughout with rapid percolation. The seasonal high water table is at or near the surface during periods of high rainfall but may drop below 40 inches during the drier seasons. The surface layer contains some organic matter and plant fiber.

Bohicket soils, high

The soils are clayey and irregularly flooded. They occur in marsh areas where rivers and streams empty directly into the ocean, and may be adjacent to low-lying areas that are flooded daily or to higher-lying sandy soils. Ranging from two to five feet in height, the soils are continuously wet, soft, and viscous. Depth to high water table is zero to three feet.

Note: The Leon fine sand category is rated severe for dwellings and very severe for septic tank filter fields. All other categories have the same ratings for both uses. For the purpose of the Caswell Beach Suitability Map, the very severe rating is used.

Caswell Beach Soil Suitability Percentages

	Total Acreage	Percentage
Very Severe	1428.72	75.6
Severe	52.70	2.8
Moderate	82.38	4.4
Slight A	234.81	12.4
Slight B	90.09	4.8
Total	1888.70	100.0%

Adjusted Figures

	Total Acreage	Percentage
Very Severe	160.84	32.7
Severe	0.00	0.0
Moderate	6.64	1.3
Slight A	234.81	47.7
Slight B	90.09	18.3
Total	492.38	100.0%

Soil Suitability Percentages were determined for the entire area incorporated by Caswell Beach. Because a large portion of the incorporated land is coastal wetlands, and not suitable for development, adjusted percentages were developed to better reflect the land area where growth has and will continue to occur. The area from which the adjusted figures were derived is designated on the Suitability Map.

Circumstantial Mistakes

It is all too easy to attempt to point the blame for the failure of septic tanks at individuals such as the builder, the septic tank installer, the Health Department Official, the home owner, or some other State or Local Official. It is true that all of these people may make mistakes from time to time which can result in a septic tank failure, but they are done in an unconscious manner.

Caswell Beach could get in such a predicament because it is growing very fast and more demands are placed on the septic tank regulation entities. With this additional pressure for growth, the following errors are commonly made:

1) Lots with high water tables which should have never been approved by the local Department and the soil scientists are approved, because the lot was inspected during the dry seasons.

2) Percolation tests which are not done properly because of limits on time and manpower are the beginnings of septic failures. Examples of this situation are not enough percolation test points, and test holes which were not saturated the day before readings are made. Most of these shortcuts are used only where work loads increase and result in the improper analysis of the proposed building lot.

3) If this percolation rate is in error then the design of the septic system is in error also. Usually this results in a waste water absorption system that is too small for the moist conditions that actually exist. In addtion, many of the systems are placed too deep and the drainage lines become flooded from a rising water table.

4) Small lot size is another variable that restricts the effectiveness of a septic tank filter field by demanding smaller absorption field areas so the drainage system can stay within the boundary of the lot. A minimum lot size ordinance in Brunswick County would helpto alleviate this common problem and take pressures off the persons involved with regulation.

5) Septic tank system installation is a very important business to insure a functioning system. It is necessary to dig to the correct depth, place in the right drain tile, with the proper grade, on top of the most efficient filter gravel in the absorption trench, to match the individual site needs. All too often one of these important variables is overlooked.

6) Finally, maintenance and proper operation of the finished septic tank system by the home owners or occupants is a most important variable to insure a functioning, "healthy" system. Too often the wrong chemicals and objects are flushed into the

III. SEPTIC TANK PROBLEM AREAS

Introduction

A major factor influencing the health of individuals where public sewers are not available is the proper disposal of human excreta. Many diseases, such as dysentery, typhoid, infectious hepatitis, para-typhoid, and various types of diarrhea are transmitted from one person to another through the fecal contamination of food and water, largely due to the improper disposal of human wastes. For this reason, every effort should be made to prevent such hazards and to dispose of all human waste so that no opportunity will exist for contamination of water or food.

Safe disposal of all human and domestic wastes is necessary to protect the health of the individual and the community and to prevent the occurance of a bad public nuisance. Although "the two-holer" had a noteworthy and honorable place in history the advancement of indoor plumbing has been the major "savior" of disposing human wastes in a sanitary manner. In a non-urban area such as Brunswick County the principal method used to handle such wastes is the septic tank and filter field. To accomplish satisfactory, sanitary results, such wastes must be disposed of so that they meet the following criteria:

1) They will not contaminate any drinking water supply.
2) They will not give rise to a public health hazard by being accessible to insects, rodents, or other possible carriers which may come into contact with food or drinking water.
3) They will not give rise to a public health hazard by being accessible to children.
4) They will not violate laws or regulations governing water pollution or sewage disposal.
5) They will not pollute or contaminate the waters of any bathing beach, shellfish breeding ground, or stream used for public or domestic water supply purposes, or for recreational purposes.
6) They will not give rise to a nuisance due to odor or unsightly appearance.

These criteria can best be met by the discharge of domestic sewage to an adequate public or community sewerage system. Septic tanks and soil absorption trenches are generally considered by health authorities and the construction industry as an interim solution for waste disposal in urban or semi-urban conditions. In other words, they are used when a public sewage disposal system is non-existent or not immediately available. However, when the above criteria are met, and where soil and site conditions are favorable, the septic tank system can be expected to give satisfactory service. Experience has shown that adequate supervision, inspection and maintenance of all features of the system are required to insure compliance in this respect.

tanks and too heavy of an overload is placed on the capacity of the filter fields to absorb the waste waters. When waste input exceeds design capacity output, like in the beach areas during summer visitation, the system become worthless. Also chemicals and grease may be placed into the tank which may kill or overload the digestion capabilities of the bacteria.

The use of septic tanks filter fields in defining soil suitability takes into consideration a functional properly operating system. This is a subsurface system of tile or perforated pipe that distributes effluent from a septic tank into natural soil. The soil material from a depth of 18 inches to 6 feet is evaluated. The soil properties considered are those that effect both absorption of effluent and construction and operation of the system. Properties that effect absorption are permeability, depth to water table and susceptibility to flooding.

The use of bearing capacity, as used in this report relates to the ability of a three story residential building to be supported by foundation footings in an undisturbed soil.

The Problem

The problem of malfunctioning septic tank systems can be more than just a local problem within Caswell Beach, but a statewide and nationwide problem as well. All too often a septic tank system in a coastal county does not function properly and creates an environmental problem in an otherwise healthful neighborhood. A study conducted by the Brunswick County Planning Department has indicated that 78.4% of the City's total land acreage has been judged to be unsuitable for conventional septic tank systems.* This percentage does not take into effect the spatial arrangement of development on the better soils, but it does indicate a large number of soils which cause septic tank failures. Failure will mean that either improperly treated sewage is being injected into shallow ground waters of the area, or that sewage effluent appears on the ground surface at sometime during the year to be washed into nearby surface waters with each subsequent rain storm.

Problem areas arise within the City when septic tanks are found in suburban-like subdivisions with small lot sizes, with disturbed or impermeable soils, with seasonally high water tables, and with associated high rates of water usage in the home. In these circumstances the conventional septic tank system is just not well suited for sewage disposal.

*" Soil Survey of the Outer Banks, North Carolina, Part 1"

Natural Causes of Failures

The most common cause of any septic tank failures in Caswell Beach would be the installation of septic tank systems in soils which have seasonally high water tables. In these areas the lot receives a percolation test by the County Health Department Representative and if the climatic conditions are such that the soils "perc" because of a seasonally low water table, the system is then designed according to the present condition and the waste disposal system is installed. After some time, seasonal changes cause the water table to rise and the new system stops functioning.

Another cause of failure would be from the presence of an impervious layer which reaches a certain saturation point after a rain and retards the vertical movement of water. These layers may be hardpans (clays), sandpans, and organic stain layers. The unique situation in Brunswick County is the fact that these impervious layers are scattered in a haphazard fashion and are somewhat unpredictable in determining their spatial arrangement. Percolation test points are not a good indication of well drained soils to be used for filter fields, because the test point may easily miss one of these layers that could be present in Caswell Beach

Particularly the organic stain layer is a difficult soil structure to pin point because of its allusive nature caused by uneven organic decomposition. They present a most difficult problem to soil scientists and Health Department personnel within the County, to adequately predict where they can be found.

Out of the County's total land acreage of 558,720 acres, the following breakdowns resulted from the land suitability analysis:

	Category	Acres	% of Total
1)	Soils with Limitations for Functional Septic Tank Systems	1481.42	78.4
2)	Soils with Limitations for the Adequate Support of Building Foundations	1481.42	78.4
3)	Soils Well Suited for Development	407.28	21.6

Controls

Direct Regulation: This method of controlling the problem of septic tanks is presently being utilized by the County Sanitarians. The local health officials guide the installation of a septic tank system according to State Board of Health Regulations which are incorporated into the Brunswick County Ordinance.* There are many variables involved and it is a very complex system to regulate, since it requires quite a few steps performed by various individuals. However if a septic tank system is allowed on a lot the following precise sequence of actions must take place:

1) An evaluation of the soil and percolation tests must be properly conducted to provide a bisis for the size and design of the system.
2) A workable layout must be drawn up by an experienced and competent designer.
3) Once the design is drawn, there can be no later changes in house layout, or additions to the system, otherwise the drain field will be too small for the input.
4) There must be no removal or disturbance of the soil during construction because such disturbances cause compaction which reduces the permeability of the the soil.
5) Installation crews must be able to install the appropriate system without disturbing the soils and being able to keep the drain lines level, while carefully following the contour of the lot, and adding sufficient gravel in the trenches.
6) There must be no disturbance of the soil after installation caused by deep gardening, digging holes, adding pavement, etc.
7) The homeowner must understand the functioning of the whole system and maintain it in the proper working order.

Unfortunately not all of the above actions are followed all of the time and septic systems will fail. It places the local health officials in an awkward position, because they are not able to supervise thoroughly all of the steps. This problem arises in Brunswick County because of large housing demands creating large work loads on limited funding and manpower in the local health department.

Subdivision Regulations: Brunswick County does have a local subdivision ordinance which helps to alleviate septic tank problems, unfortunately it was enacted too late in the development of the County. This Ordinance generally involves the review of the plans for a large residential development or smaller subdivisions by local planning, soils and health officials. Among other things, the soils capability to contain and handle the wastes of a septic tank disposal system is evaluated. Thus the Subdivision Ordinance allows for better review of new projects and notifies the various departments of impending redidential developments. In this way they can more effectively enforce their own regulations.

* Brunswick County Board of Health Regulations

Public Sewer Extensions: A third method of controlling septic tank problems in Caswell Beach is through the extention of public sewage disposal systems. Even though there are a limited number of public sewage disposal systems in operation throughout the City their numbers will greatly increase in the future as development increases. As the new subdivisions increase in both size and numbers, there will be a point reached in density which can not be safely served by purely septic tank systems alone. When this optimum point is reached the only feasible alternative is building a public sewer system which eliminates the septic tank problem altogether. Caswell Beach is currently included in the Southeast Brunswick County 201 Facilities Plan, however, because of funding problems at federal and state levels, it is uncertain whether or not they will remain in the program.

Conclusion: Caswell Beach does not presently have a septic tank problem, but due to their present rate of residential growth, and their proximity to many environmentally fragile areas, they could very likely develop severe public health problems in regard to their septic tank systems. Even though their systems are presently functioning properly, there may be detrimental affects on the quality of ground and surface waters by too rapid filtering action in the coastal sands.

FRAGILE AREAS

Located along the North Carolina coast, Caswell Beach recognizes areas which are environmentally fragile and for which development is discouraged or subject to specifications. In compliance with the Coastal Area Management Act (1974), Areas of Environmental Concern (AEC's) have been disignated for the County. The following list of items apply to some of the fragile areas in Caswell Beach. On the map of Fragile Areas, this list is associated with the designations of Ocean Beaches and Shoreline and Wetland Wildlife Habitat.

1) Coastal Wetlands- Low Tidal Marchland Description. Defined as Marshland consisting primarily of Spartina alterniflora and usually subject to inundation by the normal rise and fall of lunar tides.

2) Coastal Wetlands-Other Coastal Marshland Description. All other marshland which is not low tidal marshland. Appropriate land uses are those which will not alter natural functions. Examples of acceptable land use may include utility easements, fishing piers, and docks.

3) Estuarine Waters Description. Estuarine Waters are defined in G.S. 113229(n) as, "all the water of the Atlantic Ocean within the boundary of North Carolina and all the waters of the bays, sounds, rivers, and tributaries thereto seaward".

4) Renewable Resource Areas-Watersheds or Aquifers-Special Aquifer Areas-Outer Banks and Barrier Islands Description. Areas of well-drained sands that extend downward from the surface to include an extensive area of fresh water that is an important source for a public water supply edentified by the North Carolina Department of Human Resources, Division of Health Services, or that are classified for water supply use pursuant of Health Services, or that are classified for water supply use pursuant to G.S. 143-214.1. Appropriate land uses are those which do not rely upon subsurface waste disposal system or result in salt water intrusion.

5) Areas Subject to Public Rights-General Description. Areas such as waterways and lands under or flowed by tidal waters or navigable waters, to which the public may have rights of access or public trust rights of access or public trust rights; and areas which the State of North Carolina may be authorized to preserve, conserve, or protect under Article XIV, Section 5, of the North Carolina Constitution.

6) Areas Subject to Public Rights-Certain Public Trust Areas Description. All waters of the Atlantic Ocean and the lands thereunder from the mean high water mark to the seaward limit of State jurisdiction; all natural bodies of water subject to measurable lunar tides and lands there-under to the mean high water mark; all navigable natural bodies of water and lands thereunder to the mean high water mark or ordinary high water mark as the case may be, except privately owned lakes to which the public has no right of access. Appropriate land uses are those which do not interfere with public right of navigation. Navigational channels, drainage ditches, bulkheads and piers are appropriate land uses.

7) Natural Hazard Areas-Sand Dunes along the Outer Banks Description. Dunes are defined as ridges or mounds of loose wind-blown material, usually sand. Appropriate land uses are those employing engineering practices and site preparation to minimize unnecessary damage.

8) Natural Hazard Areas-Ocean Beaches and Shoreline (on the Outer Banks) Description. These are defined as land areas without vegetation covering, consisting of unconsolidated soil material that extends landward from the mean low tide to a point where any one or combination of the following occur: a) vegetation, or b) a distinct change in predominant soil particle size, or c) a change in slope or elevation which alters the physiographic land form. Appropriate land uses are those which preserve to the greatest extent feasible, the opportunity to enjoy the physical, aesthetic, cultural, and recreational qualities of the shorelines.

9) Natural Hazard Area-Coastal Floodplains Description. Coastal floodplain is defined as the land areas adjacent to coastal sounds, estuaries, or the ocean which are prone to flooding from storms with an annual probability of one percent or greater (100-year storm). Land uses must comply with standards of the Federal Insurance Administration.

10) Natural Hazard Areas-Excessive Erosion Areas Description.
A. General Description- areas where geologic and soil conditions are such that there is substantial possibility of excessive erosion or seismic activity.
B. Coastal Inlet Lands Description- defined as the natural zone of migration of coastal inlets. Recreation, conservation, and easements for access are appropriate uses. Moveable temporary structures are recommended for recreational purposes.

11) Natural Hazard Areas-Excessive Erosion Areas-Ocean Erodible Areas Description. Defined as the area above mean high water where excessive erosion has a high probability of occurring. In delineating the landward extent of this area, a reasonable 25-year recession line shall be determined using the best scientific data available. Appropriate land uses are recreation, conservation, and easements for access.

12) Natural Hazard Areas-Excessive Erosion Areas-Estuarine and River Erodible Areas Description. Defined as the area above ordinary high water where excessive erosion has a high probability of occurring. In delineating the landward extent of this area, a reasonable 25-year recession line shall be determined using the best available information. Permanent or substantial residential, commercial, institutional or industrial structures are not appropriate land uses.

The following development standards applicable to all AEC's have been established:

1) No development should be allowed in any AEC which would result in a contravention or violation of any rules, regulation, or laws of the State of North Carolina or of local government in which the development takes place.

2) No development should be allowed in any AEC shich would have a substantial likelihood of causing pollution of the waters of the State to the extent that such waters would be closed to the taking of shellfish under standards set by the Commission for Health Services pursuant to G.S. 130-169.01.

In addition to the above invironmentally fragile areas, Caswell Beach recognizes it's one archeological site as an area to be environmentally protected.

ARCHEOLOGICAL SITES

Throughout Brunswick County, there are approximately 135 known archeological sites. It is important to take note of these locations in the planning process to insure they are not adversely affected by new development.

Archeological resources are objects and/or areas made or modified by man and the data associated with these artifacts and features. These resources rest in or on the ground. Any alteration of the land destroys the associated information and endangers the artifacts themselves. Although most of the known archeological sites in Brunswick County have not been evaluated for their significance, a majority are suspected to have been temporary camp locations used by early Indians for the purpose of shellfish harvesting. But until these sites can be properly evaluated by a competent archeologist, care should be taken to preserve them.

Archeological sites need not be a deterrent to development. The significance of their location in the planning process is to encourage their evaluation before any development is allowed to occur which might harm or destroy them. The government requires all known archeological sites to be evaluated before construction begins on any project financed in whole or part with State or Federal money. Ideally, all sites should be evaluated before construction begins, regardless of the source of funding.

CASWELL BEACH
FRAGILE AREAS

PREPARED BY THE BRUNSWICK COUNTY PLANNING DEPARTMENT

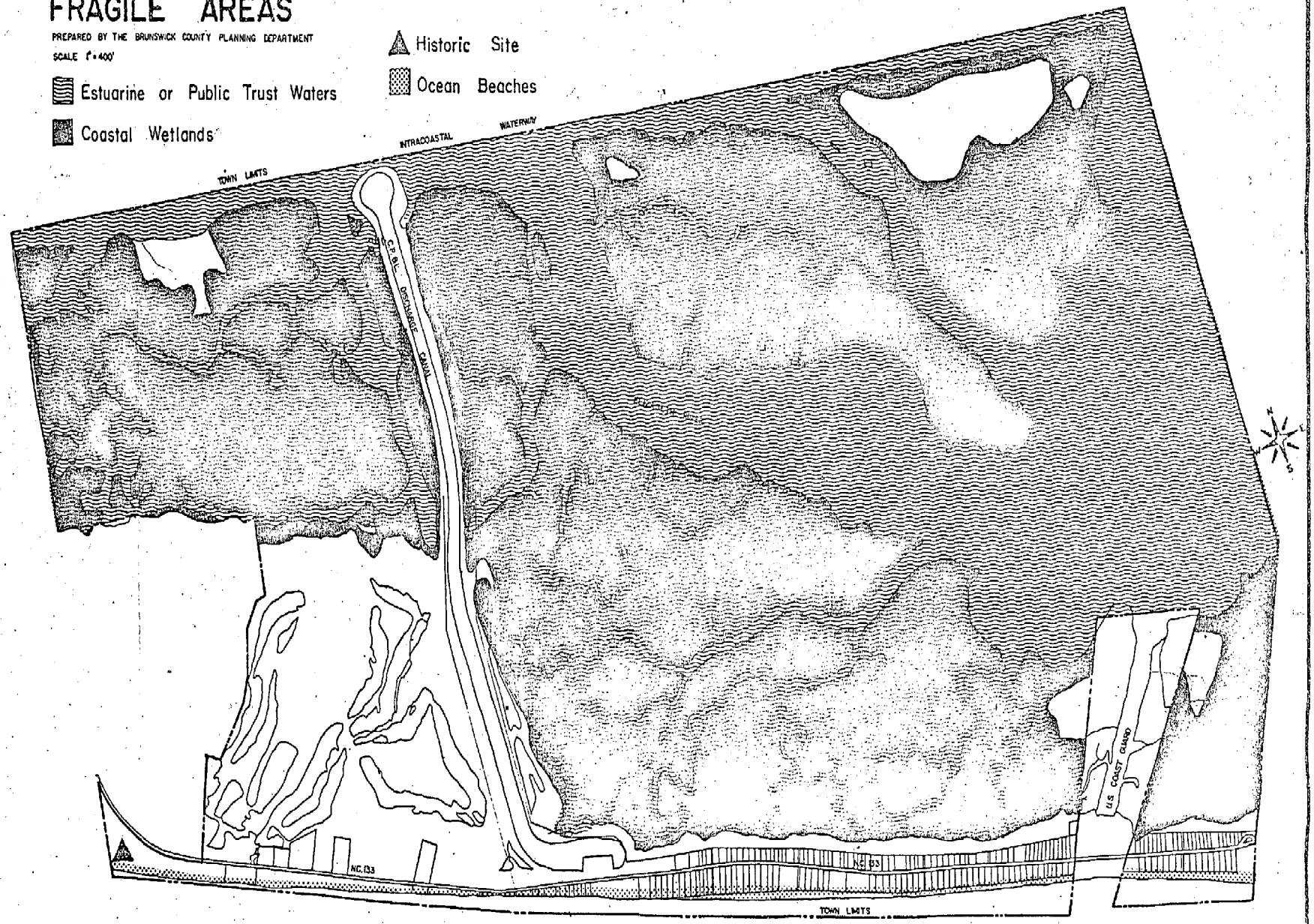
SCALE 1"=400'

Historic Site

Ocean Beaches

Estuarine or Public Trust Waters

Coastal Wetlands



Brunswick County Planning Department 1980 cpb

PRINCIPLES AND STANDARDS FOR FUTURE DEVELOPMENT

Depending on where a particular type of land use locates, it has economic, environmental, safety, and convenience affects on the surrounding land and society. For example, some locations are better for industrial uses than others. In order to provide for the most efficient and beneficial effect of a particular development, principles and standards can be used to guide it's location.

A principle is a general idealized relationship between a land use and the surrounding land and people. General principles relating to the location of land uses customarily identify three major functional areas in the urban complex: the work areas, the living areas, and the leisure time areas. Principles for each of the above areas are outlined in the following pages.

Standards are specific measurement units used to quantify the terms appearing in the statement of principles.

Standards are not absolute, but rather guides to be followed under average circumstances. For each of the three principle categories (work, living, & leisure time areas), standards are provided in several classes: environment; convenience; security; and performance.

In order to consistently and rationally review development proposals in and around Southport, the Board of Aldermen will use the following principles and standards. These principles and standards will form the basis of land use regulations and suggested amendments to existing regulations will be judged in relation with these statements.

In the case that a proposed development or some aspect of a proposed development is not covered by a law or ordinance, these principles and standards can be used by city elected and appointed officials as a foundation for negotiation with developers.

LIVING AREA - GENERAL CONSIDERATIONS

Residences are normally the largest users of land in the urban community. Most urban areas range from two-thirds to three-quarters developed for residential purposes. In a few cases, the proportion may run to 90 percent or more.

In designating areas for residential development, it is desirable to think in terms of whole neighborhoods and communities from the earliest stages of planning as opposed to individual subdivisions and apartment developments. By so doing, we can assure the proper relationship of residences to non-residential uses, and an efficient street and utility network, minimizing the possibility of later disruption of the residential environment for such things as major new roadways or unwarranted changes of land use.

Neighborhoods are primarily devoted to homes--single-family and multi-family-- and residentially oriented uses such as churches, elementary schools, neighborhood parks, and neighborhood shopping facilities. In their design, emphasis should be placed on tying these elements together by a system of collector streets

and pedestrian ways. Neighborhoods should be bounded but not crossed by major traffic arteries. Where possible, neighborhoods should be structured and linked to each other by permanent open spaces - stream valley parks, sharp topography, etc. The same general principles are true for the community: an indentifiable system of neighborhoods linked to each other by the transportation system and focused on the community center; bounded by major highways, landforms, institutional uses. etc.

LIVING AREA PRINCIPLES

1. Residential communities should be located in areas that are not extremely low, or poorly drained.

2. Where applicable, residential communities should locate in close proximity to major thoroughfares and the transit system with direct connections to work and leisure time areas. They should be bounded but not penetrated by major streets and internally served by a system of collector and service streets fitted to the terrain with due consideration of drainage, sunlight, and scenic views.

3. Local shopping facilities should locate on sites adequate for shops, accessory off-street parking and loading, and landscaping; convenient to specific local tributary trade areas and accessible for receiving goods.

    A. Neighborhood-serving stores should locate within convenient walking distance or driving distance (in low density areas), with due consideration for pedestrian access and the amenity of surrounding areas.

    B. Community-serving shopping centers should locate on major thoroughfares, at the intersection of a major crosstown street, or toward the edge of tributary trade area, with consideration for intergrated design of the center and amenities of surrounding areas.

4. Schools should locate on reasonably level sites, adequate for buildings, recreation facilities, and landscaping, and with due consideration of the safety of children as well as the amenity of surroundings.

    A. Upper-level schools should be within a convenient community range.

    B. Lower-level schools should be within walking distance of the age groups served, except in low density areas where convenient driving range rather than walking distance becomes crucial consideration.

5. Churches should locate on reasonably level sites, adequate for parking and landscaping, convenient to potential membership.

    A. For neighborhood-serving churches, walking distance is important.

    B. For community -serving churches, accessibility to major street systems is important.

6. Playground and park areas should be located on reasonably level sites, possibly in conjunction with schools, within easy walking distance of age groups served (or within convenient driving range for low density areas), and adequate for appropriate active recreation facilities and for surrounding planted strips. Quiet parks should locate on steep, level, or low sites and fingers of open space along water courses and in low areas, intergrated with active and passive recreation areas and the larger open space system of the city according to the opportunities offered by the topography of the locale.

7. A range of choice in residential densities should exist, with high densities in close proximity to permanent open space and nearest to the thoroughfare and transit systems and community shopping centers.

8. Different housing types and densities should be located with consideration of the potential for degredation of the environmentally sensitive areas and areas of high natural value.

9. Low cost housing should be located throughout the city, with various density levels available to low income persons in proximity to employment centers.

10. Residential development should be kept well away from airport approach zones and "runup" areas because of:

    A. Noise
    B. Crash hazards
    C. Likelihood of industrial growth near the airport.

    Since all three of these are likely to exert a detrimental effect on residences, the Federal Housing Administration will not insure home mortgages within defined areas around airports where these factors are present. Many conventional lending institutions now follow similar practices. Because locations near airports are extremely attractive to many industries, there is no real problem in finding alternatives to residential use.

LIVING AREA STANDARDS

Definitions:

1. High Density Residential = 8 Dwelling units or above per acre.
2. Middle Density Residential = 2 to 7 Dwelling Units per acre.
3. Low Density Residential = 1 Dwelling Unit per acre or less.
4. Low-Low Density Residential = 1 Dwelling Unit per 2-5 acres.

Environmental Location Standards

1. Areas that are wooded and have interesting topography and views should be utilized for residential purposes.

2. Low-Low Density Residential should be the only density development in headwater areas of the water supply reservoirs.

3. All housing with a density greater than 1 dwelling per acre should be served by a public sewerage system.

4. Low density housing utilizing on-site disposal methods for sewage (septic systems) shall be located in areas with soils that have a minimum perculation rate of 1" per hour and of generally well established good permeability.

5. Construction of new housing with density great enough to require sewer line extensions shall be located in areas where the stormwater run-off will not cause pollution of the water supply and the extension of line shall not cause an undue burden of public expenditures.

Environmental Performance Standards

1. Maximum percentage of lot covered by imprevious surface is to be as follows:

   a. Low-low Density Residential - 10%
   b. Low Density Residential - 20%
   c. Middle Density Residential -30%
   d. High Density Residential - 30%

2. In construction of new housing, only those trees which are necessary to remove for construction, should be removed.

Safety Standards

1. No housing should be located below a 100-year flood plain. Housing which is located on a flood prone area shall be built on stilts so that all habital space is above the 100 year flood elevation.

2. All housing should be located within four miles of a fire station.

3. Roads in middle density or greater residential areas longer than 800 feet should have at least two access points.

Convenience Standards

The table below indicates standards for the desirable time-distances from residential areas to locations of various facilities.

Facility	High	Middle	Low
Employment Centers	20 min.	30 min.	45 min.
Central Business District	25 min.	40 min.	60 min
Local Shopping Center	10 min.	15 min.	20 min
Elementary School	½ mile	1½ miles	5 miles
Junior High School	1 mile	3 miles	10 miles
Senior High School	1 mile	4 miles	15 miles
Playgrounds and Local Parks	10 min	20 min.	*

SUPPORT STABILITY - POPULATION REQUIRED

The figures below represent the number of people required to support each type of shopping facility for it to be viable in the community. These should be taken into account when planning commercial development.

Local family shopping	1000-2500 people
Convenience Items	2500-3000 people
Neighborhood Shopping Center	7500-20,000 people
Community Shopping Center	20,000-100,000 people
Regional Shopping Center	100,000-250,000 people

STABILITY - LOCATION REINFORCEMENT

1. NEIGHBORHOOD SHOPPING CENTER OR STORE:

   Stores or neighborhood shopping centers should locate in a non-competitive position at least a 2 - mile distance from any competing center. Any condition promoting further commercial strip development should be eliminated.

2. COMMUNITY SHOPPING CENTER:
   Community Shopping Centers should locate such that no competing center is within 5 - 10 miles that draws on the same market population.

3. REGIONAL SHOPPING CENTER:

   Regional Shopping Centers should locate such that no competing center is within 10 - 25 miles that draws on same market population.

BASIC CONSIDERATIONS - REASONABLE SIZE

Local Family Shopping	5 - 10,000 sq. ft. with 30-50% in storage
Neighborhood Shopping Center	5 acres for 7500 pop.; 20 acres for 20,000 pop.
Community Shopping Center	20 acres for 20,000 pop.
Regional Shopping Center	40 acres for 100,000 pop. 60 acres for 25,000 pop.

Definitions

Neighborhood Center	40,000 sq. ft. selling area
Community Center	100,000 to 300,000 sq. ft.
Regional Center	One to Four major department stores.

REGIONAL SERVING BUSINESS AREA PRINCIPLES

1. In general, regional serving business areas should locate near adjoining traffic flows, central to their tributary trade areas.

2. The central business district should be located close to the peak flow of vehicular and pedestrian traffic. Retail, professional, financial, and related services should be conveniently accomodated and made easily accessible to adequate parking, transit, and regional transportation services for clientel and employee groups patronizing or working in the CBD.

Facility	High	Middle	Low
Playfields and Recreation Centers	10 min*	20 min*	*
Public Park or Reservation	45 min.	45 min.	*
Regional Shopping Center	20 min.	30 min.	40 min.
Transit System Shop	5 min.	20 min.	*
Major Thoroughfare	5 min.	5 min.	20 min.

*It is assumed that because of the nature of the life style and private amenities of low density housing-public parks, playgrounds, recreation centers and public transits need not be provided by the government.

EDUCATION PLANNING STANDARDS

1. SIZE OF SCHOOL ENROLLMENT

$$\#\text{rooms needed} = \frac{\text{Ultimate enrollment projected}}{\text{average class size}}$$

Average class size = pupils/room for grades 1-6 (Set by N.C. Department of Public Instruction):

Elementary	400-700
Junior High School	500-1,200; optimum 700-1,000
Senior High School	500-1,800; optimum 700-1,500

2. Size of School Site

   a. Elementary: (min) 20 acres and one additional acre/100 pupils
   b. Junior High School: (min) 20 acres and one additional acre/100 pupils
   c. Senior High School: (min0 30 acres and one additional acre/100 pupils

3. Travel Distances - Service Radius

	Vehicle(miles)	Walking (miles)
Elementary	½ - 3/4	3/4
Junior High School	1 - 1½	1½
Senior High School	1½ - 2	2

4. Senior High Schools are best placed near major thoroughfares because they generate their own traffic and are accessible to the public for auditoriums, stadiums, etc.

   SOURCE: N.C. Department of Instruction

COMMERCIAL STANDARDS

TRANSPORTATION STANDARDS

1. Commercial areas should be located at the intersection of arterial streets, with limited access, that is no less than 1300' from the intersection. Additional lanes for access and egress traffic should be provided.

2. A 3/1 to 6/1 parking / sales area ratio should exist, with all parking within 400' maximum of magnet uses .

3. Regional Business Centers:

   A. Regional shopping centers should be located in two major arterials in tributary trade area (50 - 100,000 families). The site should be adequate to accomodate peak parking needs and a complete line of shop and store types, eating and entertainment facilities, and branch business and financial services sufficient fill several of a shopper's time (30 to 150 acres).

   B. Satellite CBD centers (office parks, automobile sales and service centers, Appliance centers, farmers market, service centers, etc.) should be located on intersections or radial and circumferential arteries and on one or more major transit routes with adequate parking and service areas.

   C. Highway Service Centers should be located in outlying areas on major highway approaches to urban areas. Sites should be adequate for integrated design of drive-in services and motel accomodations. Proper consideration is given to highway safety, roadside beauty, and the general amenity of adjoining uses.

4. The site must be physically suitable for development as one center internally arranged or , where appropriate, in an integrated series of sub centers, with consideration given to parks and other open spaces, approaches and general amenity within the area and in adjoining use areas.

MANUFACTURING, WHOLESALE, AND RELATED USE AREA PRINCIPLES

1. In general, manufacturing, wholesale, and related use areas should be located on reasonably level land, preferrably with not more than 5 percent slope or capable of being graded without undue expense.

2. A range of size and choice inclose - in fringe, and dispersed locations should exist.

   A. Extensive manufacturing requires large open sites for modern one-story buildings and accessory storage, loading and parking areas in fringe and dispersed location. Usually, 5 acres is the minimum size. With some sites 10, 25, 50, 100 or more acres, depending on the size of the urban area and economic outlook for industrial development of extensive lines of activity.

   B. Intensice manufacturing requires a variety of sizes for modern one-story buildings and accessory storage, loading, and parking areas in close-in and fringe locations. Site size is usually under 5 acres.

3. Locations should have direct access to commercial transportation facilities. Fringe and dispersed locations should have access to railroad, major trucking routes, cargo and airports. A major portion of the sites should have access to both railroad and trucking routes, while the rest at least have access to adjoining trucking throughfares.

4. Locations should be within easy commuting time of residential areas of labor force and accessible to transit and major thoroughfare routes directly connected with housing areas.

5. Utilities at or near the site such as power, water, and waste disposal facilities should be available.

6. Proposed developments and locations in the extra-terrirorial jurisdiction should be compatible with surrounding uses, possibilities of protective belts or open space, development of "industrial parks" and other factors as amenity both with the manufacturing area and in relation to adjoining land uses.

INDUSTRIAL STANDARDS

Definitions of Density Classes

	Workers per Acre	
	Net	Gross
Intensive	147	50
Intermediate	40	18
Extensive	18	6

ENVIRONMENTAL LOCATION STANDARDS

1. Location of industry, especially that which has a high possibility of producing non-point sources of pollution should not be near water courses or the Cape Fear River unless control measures can be incorporated into the design of the facility to limit runoff.

2. The location of polluting industries should be banned from airsheds of residential and central areas, space must be allocated for these industries where they will do the least harm.

3. Buffer zones should be required between industry and neighboring residential areas which effectively screen all negative effects such as noise, vibration, etc.

TRANSPORTATION LOCATION STANDARDS

1. A site of 20 acres or more and employs over 800 persons per shift, needs direct access onto arterial street. Under all other conditions, access should be indirect via an industrial street.

2. Locations require short, fast and direct truck access via major or arterial streets from service industries upon which the industry will depend.

3. Sites should be near sources of labor (residence areas) with specific emphasis on convenience for type employed. Maximize walk to work potential to reduce parking and travel demands.

    A. Industries which employ part time unskilled females or males primarily should locate close to low-middle and low income housing areas, fostering a walk-to-work pattern.

B. Industries which employ full time highly skilled technicians or professionals should locate in convenient driving distance from middle and upper-middle income residence areas.

GENERAL SITING CONSIDERATIONS

1. No industrial sites should be less than 200 feet in depth and 100 feet in width.
2. Railroads should be located at side or rear of Industrial property lines.
3. For industrial developments, off-street parking should be provided in accord with the following schedule:

   A. 1 space for each 1000 sq. ft. of warehouse floor area
   B. 1 space for each 500 sq. ft. of manufacturing or research floor area
   C. 1 space for each 400 sq. ft. of office floor area

GENERAL SITE DEVELOPMENT STANDARDS

Industry Type	Minimum Front Yard Setback	Minimum side and Rear Yard Setback	Bilding Coverage
Warehousing and General Industry	25 feet	10 feet	70%
Neighborhood Industry, Prestige Industry	100 feet	100 feet	25%
Nuclear, Explosive or Erosive Industry	2000 feet	2000 feet	10%

TRAFFIC GENERATION

Average trip generations have been established for different types of industries. These are presented in the Industrial Traffic Generation table on the following page. When planning industrial locations and devleopment, such standards should be considered for estimating impacts the development may have on the transportation system in the area as well as the safety of area citizens.

INDUSTRIAL TRAFFIC GENERATION

Land Use	Density (Employees/ Acre)	Range (Number/Acre	Typical	Range (Number/1000 square feet floor)	Typical
Highly automated industry ..... low employee density (refinery, warehouse)	5	2.8	4	0.2-1.0	0.6
Light service industry... Single-lot industry (lumber yard)	5-20	6-30	16	1.4-1.2	0.8
Industrial tract..... (5 acres) (machinery factory)	20-100	30-160	70	0.6-4.0	2.0
Office campus ..... research & development (research industry)	100	150-200	170	3.8	4
Mixed central industry..	varies	10-200		1.4	

CASWELL BEACH

POPULATION PROJECTIONS

I. Introduction

Population projections provide the basis for most major planning decisions. It is on these projections that planning future needs for services and facilities are based. Not only are the total number of people important but also whether they are permanent or seasonal residents.

To be sure, projecting population is a guessing game because the influences that create the ebb and flow of people is unpredictable, therefore, projections are made on the assumption that the general conditions at the time of the projection will remain stable. Projections must be reviewed often and updated based on conditions at the time of the review.

The population of Caswell Beach has already exceeded projections made in the early 1970"s for the year 1990 because the degree of current seasonal development was unknown at that time.

Contained within this section are the projections of Caswell Beach's population through the year 2000.

CASWELL BEACH POPULATION PROJECTIONS

Year	Brunswick County	Caswell Beach Permanent	Percent of County	Caswell Beach Seasonal	Subtotal
1985	51,200	89	.17	615	704
1990	64,300	112	.17	773	885
2000	78,000	135	.17	932	1067

Sources: N.C. Department of Administration
Cape Fear C.O.G.
Consoer, Townsend & Associates, Southeastern Brunswick County Facilities Plan
Brunswick County Planning Department

CASWELL BEACH PROJECTED POPULATION CHANGES

Year	Caswell Beach Population		Percent Change	
	permanent	seasonal	permanent	seasonal
1985	89	615	4.7%	4.8%
1990	112	773	25.8%	25.7%
2000	135	932	20.5%	20.6%

Due to the nature of the population projection methodology, as outlined on the following page, the 1985 population is somewhat lower than might be expected. But the methodology is based historically on average increases and percentages of County population, and therefore is thought to be the best method to utilize for the Caswell Beach Population Projections.

As in the past, Caswell Beach will continue to be a small percentage of the County's population. The seasonal population of Caswell Beach shall continue to be approximately seven times the permanent population.

The 1980-1985 population change of Caswell Beach is, like the 1985 population, somewhat lower than might be expected. Again, this low percentage is due to the population projection methodology. From 1985-1990, the population percentage increase in Caswell Beach is projected to be 25.8% for permanent and 25.7% for seasonal populations. This increase is expected to drop somewhat for the 1990-2000 era with 20.5% for permanent and 20.6% for seasonal. This drop will be reflective of the rapid filling in of available developable land in Caswell Beach.

Population Projection Methodology

Projections for Permanent Populations are based upon a ratio-step down method from historical and existing population trends in Brunswick County and Caswell Beach. Through simple analysis, it was learned that the ratio of the Brunswick County population to the Caswell Beach permanent population, respectively, had remained fairly constant from 1970 to 1980. Using this fact and the following assumption, the above projections were made.

Assumption: The permanent population of Caswell Beach in relation to Brunswick County's total permanent population will remain the same through time.

Projection Calculations

Year	Brunswick County Population	Caswell Beach Population	Ratio Factor
1970	24,223	36	.00148619
1975	35,621	53	.00148789
1980	38,100	85	.00223098
		Total:	.00520506

Ratio Multiplier= Ratio Factor Total ÷ 3

= .00520506 ÷ 3 = .00173502

Year	Brunswick County Population		Ratio Multiplier		Caswell Beach Population
1985	51,200	X	.00173502	=	89
1990	64,300	X	.00173502	=	112
2000	78,000	X	.00173502	=	135

The Caswell Beach Seasonal Population was based on 8.5 persons per seasonal household. The estimate of 8.5 was based upon the Citizen Questionnaire as well as interviews with local realtors and town officials.

There are 69 total 1980 seasonal units in Caswell. This projects to be 587 seasonal residents. Taken as a ratio of the permanent population of Caswell Beach, the projection for the remaining years were made. The projection ratio is 6.9058823.

Year	Caswell Beach Permanent	Caswell Beach Seasonal
1985	89	615
1990	112	773
2000	135	932

Calculation of Subtotal Population

The Subtotal Population is the addition of the Seasonal to the Permanent Populations. The Subtotal Population is the peak number of persons projected to be in Caswell Beach.

CASWELL BEACH HOLDING CAPACITY

HOLDING CAPACITY

The holding capacity of a planning district refers to the ability of the natural and man-made systems of an area to support the demands of various land uses. It refers to inherent limits in the systems beyond which change cannot be absorbed without resulting in instability, degradation, or irreversible damage.

Residentially speaking, the holding capacity of a planning district is the number of dwelling units the vacant and renewal land in the planning district will accommodate to a prescribed pattern of residential densities.

The basic elements used in determing holding capacity are projected population increases during the planning period, existing and proposed urban water and sewerage facilities, future planned development, institutional and organizational constraints, transportation systems, vunerable habitats, acquifer recharge zones, air and water quality standards established by the EPA, energy supplies, man-made hazard areas, and archeological and historical sites.

Measurement techniques for holding capacity are necessarily dynamic rather than static. Measurement is based upon current existing and proposed holding capacity elements. In the future these elements may change and thus alter the holding capacity of the planning area. Changes in the elements may be brought about by technogical advances, economic fluctuations, energy crises, new life style attitudes, and institutional changes. However major changes are not brought about in very short time spans. The holding capacity analysis is under review every five years and should therefore keep up with all element changes that have occurred. Because of this, and because the holding capacity analysis is based upon all current element trends, the resultant land use projections are thought to be rather accurate.

The result of a holding capacity analysis is a Land Use Design Map for 1990. Placement of proposed land uses, such as residential, are accurate only in their adherence to suitability and policy criteria. Regardless, the result is a fairly accurate representation of future densities and land use compatability relationships.

Following in this relationship, the Land Use Design Map is an instrumental factor in the determination of the Land Classification for 1990. The Land Classification Map is one of the most important tools of federal, state, and local level planning for land use related issues. Therefor, it is obvious that the holding capacity analysis is a valuable element in the development of the Caswell Beach Land Use Plan.

The following chart is the result of the holding capacity analysis process. Also presented is the existing (1980) Land Use Chart for purposes of comparison. The actual process is presented in outline form in the appendix.

Caswell Beach Existing Land Use

Land use	Approximate Number of units	Average Acreage Per unit	Total acreage	Percentage of developed acreage	Percentage of Land Acreage	Percentage of Total Acreage Inculding Water
Permanent Single Family	22	.57	12.56	9.54	.67	.47
Seasonal Single Family	69	.38	26.62	20.24	1.41	1.01
Commercial	1	.47	.47	.36	.02	.02
Recreation	N/A	37.05	74.10	56.33	3.93	2.81
Transportation, Warehousing, Communication & Utilities	N/A	N/A	17.80	13.53	.94	.68
Subtotal	92	1.43	131.55	100%	6.97%	4.99%
Undeveloped Platted Acreage	N/A	N/A	38.30	N/A	2.03	1.45
Undeveloped Unplatted Acreage	N/A	N/A	1716.83	N/A	91.00	65.12
Subtotal	N/A	N/A	1715.13	N/A	93.03	66.57
Water	N/A	N/A	749.90	N/A	N/A	28.44
Subtotal	N/A	N/A	2505.03	N/A	93.03%	95.01%
Total	92	1.22	2636.58	100%	100%	100%

Caswell Beach Holding Capacity

Land Use	Projected 1990 Unit Need	Projected 1990 Acreage Need	Total 1990 Units	Total 1990 Acreage
Permanent single family	8	4.56	30	17.12
Seasonal single family	24	9.12	93	35.74
Commercial	0	0	1	.47
Recreation	0	0	N/A	74.10
Transportation, Communication, and Utilities	N/A	.76	N/A	18.56
Subtotal	32	14.44	124	145.99
Undeveloped Platted Acreage	32	14.44	N/A	23.86
Undeveloped Unplatted Acreage	N/A	0	N/A	1716.83
Subtotal	32	14.44	N/A	1740.74
Water	N/A	N/A	N/A	749.90
Subtotal	N/A	14.44	N/A	2508.60
Total	32	14.44	124	2636.58

HOLDING CAPACITY APPENDIX

Caswell Beach Holding Capacity Analysis

I. Residential Existing Land Use

A. Summary of existing stock of dwelling units

On Caswell Beach there are approximately 22 permanent single family dwelling units and 69 seasonal single family units.

B. Summary of Existing Acreages in Residential Use

In Caswell Beach there are approximately 12.56 acres in permanent single family use and 26.62 acres in seasonal single family use.

C. Summary of Prevailing Net Densities

Residential Category	Total Acreage	Number Of Units	Average Acreage Per Unit
Permanent single family	12.56	22	.57
Seasonal single family	26.62	69	.38
Total	39.18	91	.43

Density Calculation

$$\frac{\text{Total residential category acreage}}{\text{Approximate Number of Units}} = \text{Average Acreage Per Unit}$$

Caswell Beach Population Data

Year	Permanent	Seasonal
1980	85	587
1990	114	787

Average Household Size Calculation

1) $\frac{\text{Total 1980 seasonal population}}{\text{Total seasonal units}} = \text{Average seasonal household size}$

$\frac{\text{587 seasonal residents}}{\text{69 seasonal units}} = \text{8.5 average seasonal household size}$

2) $\frac{\text{Total 1980 permanent population}}{\text{Total permanent units}} = \text{Average Permanent household size}$

$\frac{85 \text{ permanent residents}}{22 \text{ permanent units}} = 3.86$ Average permanent household size

RESIDENTIAL PERCENTAGES

$\frac{\text{Acreage in residential subcategory}}{\text{Total acres in residential use}} =$ Residential subcategory acreage as a percentage of total developed acreage

$\frac{\text{12.56 acres in permanent single family use}}{\text{39.18 total acres in residential use}} = .3205717$

The permanent single family land use is 32.06% of the total residential acreage of Caswell Beach.

$\frac{\text{26.62 acres in seasonal single family use}}{\text{39.18 total acres in residential use}} = .6794262$

The seasonal single family land use is 67.94% of the total residential acreage of Caswell Beach.

II. Estimate of Future Residential Need

Assumptions:

1) The average permanent and seasonal household sizes are assumed to remain constant through 1990.
2) The average acreages per unit for all residential subcategories are assumed to remain constant through 1990.
3) The relative residential percentages given in I.C. are assumed to remain constant through 1990.

A) Applied Household Size Assumptions

By applying the present average household size to the present population and the assumed future household size to the estimated future population, the difference between these two results provides a crude unadjusted estimate of the total new dwelling unit requirements.

Calculations:

1) $\frac{\text{present permanent population}}{\text{present permanent average household size}} =$ existing number of permanent dwelling units

$\frac{85 \text{ existing permanent residents}}{3.86 \text{ existing permanent residents per household}} =$ 22 existing permanent residential units

(2) present seasonal population / present seasonal average household size = existing number of seasonal dwelling units

587 existing seasonal residents / 8.5 existing seasonal residents per household = 69 existing seasonal residential units

(3) estimated 1990 permanent population / assumed permanent average household size for 1990 = projected number of permanent dwelling

114 estimated permanent residents for 1990 / 3.86 assumed average household size for 1990 = 30 projected number of permanent dwelling units for 1990

(4) estimated 1990 seasonal population / assumed seasonal average household size for 1990 = projected number of seasonal dwelling units for 1990

787 estimated seasonal residents for 1990 / 8.5 assumed average household size for 1990 = 93 projected number of seasonal dwelling units for 1990

(5) projected number of permanent dwelling units for 1990 - existing number of permanent dwelling units =

Unadjusted estimate of the total new permanent dwelling units required for 1990

30 projected permanent dwelling units needed for 1990 - 22 existing permanent dwelling units =

An unadjusted estimate of 8 total new permanent dwelling units for 1990

(6) projected number of seasonal dwelling units for 1990 - existing number of seasonal dwelling units. =

Unadjusted estimate of the total new seasonal dwelling units required for 1990

93 projected seasonal dwelling units needed for 1990 - 69 existing seasonal dwelling units =

an unadjusted estimate of 24 total new seasonal dwelling units for 1990

The total 1990 permanent and seasonal dwelling unit requirement is

B. Assumptions of Dwelling Unit Losses

Since Caswell Beach has no fire department, it is not possible to determine a fire loss percentage. Through discussion with town officials, it has been determined that such a ratio should not be applied to a holding capacity analysis in this case because of the rare incidence of fire losses. Therefore, no fire percentage ratio will be applied to the 1990 projected residential requirements.

C. Vacancy Rate Assumptions

No vacancy rate will be applied to the estimate of future residential needs because of the very small population size of Caswell Beach.

A. Holding Capacity Analysis

1. The most developable vacant, platted areas of Caswell Beach will be used for the Land Design Map of 1990. In these areas the streets already exist, so no allowance shall be made for them in the projected acreage needs of 1990.

2. Residential Net Density Table

Land Use	Number Of Units		Total Acreage		Net Density (Dwelling Units Per Acre)
Permanent single family	22	÷	12.56	=	1.75
Seasonal single family	69	÷	26.62	=	2.63

3. Residential Total Acreage Requirements for 1990

Land Use	Projected 1990 Unit Need		Unit Net Density		Projected 1990 Acreage Need
Permanent single family	8	÷	1.75	=	4.56
Seasonal single family	24	÷	2.63	=	9.12
Total	32	÷	2.34	=	13.68

3. (Cont.)

Safety factors for the allowance of errors have not been figured into these total acreage amounts.

4. Distribution Criteria

When distributing new dwelling units, priority is given to those areas with the following characteristics:

- Existing platted areas
- Existing accessibility to streets within the
- Existing pattern of development as determined from the 1975-1980 building permit records
- Existing, and proposed facilities available.
- Existing historical and/or archeological sites are not present.
- The soils are suitable for bearing capacity and a septic tank if no sewerage facilities are presently available.
- No conflict of use with adjoining and nearby properties.
- The Zoning Ordinance, and The Flood Prevention Ordinance are consistent with and favorable to the dwelling unit placement.

5. Refer to the Caswell Beach Land Use Design Map for the resulting proposed allocation of permanent single family, seasonal single family, permanent multi - family, and seasonal multi - family residential uses for 1990.

Part II: Commercial Land Use

I. Existing Commercial Land Use

A. Summary of Existing Stock of Commercial Units

On Caswell Beach there is 1 existing commercial unit.

B. Summary of existing acreage in commercial use.

On Caswell Beach there are approximately .47 acres in commercial use.

C. Summary of prevailing net densities

1. $\frac{\text{Total existing commercial acreage}}{\text{Total existing commercial units}} = \text{Existing average commercial acreage per unit}$

$\frac{.47 \text{ existing commercial acres}}{1 \text{ total existing commercial unit}} = .47$ existing average commercial acreage per unit

2. Total existing commercial acreage / Total existing developed acreage = Existing commercial acreage as a percentage of total existing developed acreage

.47 existing commercial acres / 117.27 total existing developed acreage = .004001

The total existing commercial Land Use is .4% of the total existing developed acreage.

3. Total existing commercial units / Total existing permanent population = Existing commercial units per permanent capita

1 total existing commercial unit / 66 total existing permanent population = .015

There are presently .015 commercial units per permanent capita in Caswell Beach.

4. Total existing commercial units / Total existing seasonal population = Existing commercial units Per seasonal capita

1 Total existing commercial units / 1,236 total existing seasonal population = .001

There are presently .001 commercial units per seasonal capita in Holden Beach.

II. Estimate of Future Development

Assumptions:

1. The commercial units per permanent and seasonal capita are assumed to remain constant through 1990.
2. The average commercial acreage per unit is assumed to remain constant through 1990.
3. The commercial acreage as a percentage of total developed acreage is assumed to remain constant through 1990.

A. Applied per capita assumptions

By applying the present average per capita sizes to the present populations and the assumed future per capita size to the estimated future population, the difference between these two results provides

a crude unadjusted estimate of the total new commercial unit requirements.

Calculations:

1. Existing permanent population
X
Existing commercial units per permanent capita
= Existing number of Commercial units

66 existing permanent population
X
.015 existing commercial units per permanent capita
= 1 existing commercial unit

Existing seasonal population
X
existing commercial units per seasonal capita
= existing number of commercial units.

1,236 existing seasonal population
X
.001 existing commercial units per seasonal capita
= 1 existing commercial unit

2. Projected 1990 permanent population
X
Existing commercial units per permanent capita
= Projected number of commercial units for 1990

86 projected 1990 permanent population
X
.015 existing commercial units per permanent capita
= 1 projected commercial unit for 1990

Projected 1990 seasonal population
X
Existing commercial units per seasonal capita
= Projected number of commercial units for 1990

1,360 projected 1990 seasonal population
X
.001 existing commercial units per seasonal capita
= 1 projected commercial unit for 1990

1 Projected commercial unit for 1990 - 1 existing commercial unit = 0 total new commercial units needed for 1990

B. Assumptions of commercial unit losses

Caswell Beach has not lost any commercial units by fire over the past five years. Therefore, a fire loss percentage cannot be applied to the estimae of 1990 commercial unit need.

C. Vacancy Rate Assumptions

Caswell Beach has not had any commercial units vacated over the past five years. Therefore, a vacancy rate percentage cannot be applied to the estimate of 1990 commercial unit need.

3. Fitting Space needs to land supply

A. Holding Capacity Analysis

1. The most developable vacant, platted areas of Holden Beach will be used for the Land Design Map of 1990. In these areas the streets already exist, so no allowance shall be made for them in the projected acreage needs of 1990.

Commercial Net Density Table

2.

Land Use	Number of Units		Total Acreage	Net Density (Units Per Acre)
Commercial	1	÷	.47	2.13

3. Total Commercial Acreage Requirements for 1990

Land Use	Projected 1990 Unit Need		Unit Net Density		Projected 1990 Acreage Need
Commercial	0	÷	2.13	=	0

4. Distribution Criteria

When distributing new commercial units, priority is given to those areas with the following characteristics:

- Existing platted areas
- Existing accessibility to streets
- Within the existing pattern of development as determined from the 1975-1980 building permit records
- existing and proposed facilities available.
- existing historical and/or archeological sites are not present
- The soils are suitable for bearing capacity and a septic tank if no sewerage facilities are presently available.
- No conflict of use with adjoining and nearby properties.
- The Zoning Ordinance, The Subdivision Ordinance, and The Flood Prevention Ordinance are consistent with and favorable to the dwelling unit placement.

5. Refer to the Caswell Beach Land Use Design Map for the resulting proposed allocation of commercial use for 1990.

CASWELL BEACH LAND CLASSIFICATION

The North Carolina Coastal Area Management Act Guidelines require that each city, town, and county located in the twenty county coastal areas develop a land classification map classifying all of the land within a given jurisdiction into one of five classes and their subdivisions. The criteria for the allocation of land into these categories are explicitly set forth in the State Guidelines, and the final adopted land classification maps for the twenty combined into a coordinated, consistent expression of local policy at the large regional scale.

A land classification system for Caswell Beach has been developed as a means of assisting in the implementation of goals, objectives, and policies. By delineating land classes on a map, local government and its citizens can specify those areas where certain policies (local, state and federal) will apply. Although specific areas are outlined on a land classification map, it must be remembered that land classification is merely a tool to help implement policies and not a strict regulatory mechanism.

The land classification system provides a framework to be used by local governments to identify the future use of all lands in the City. The designation of land classes allows the local government to illustrate their policy statements as to where and to what density they want growth to occur, and where natural and cultural resources will be preserved.

The land classification system includes five broad classes which will be identified by all local governments. Planning units are encouraged, however, to further subdivide these broad classes into more specific land use designations. Any sub-classes which are used should be able to be aggregated back to the original five broad classes. The five general land classes are Developed, Transition, Community, Rural, and Conservation. Two of these classes are applicable to Caswell Beach. They are Transition and Conservation.

The inclusion of a land area into a land classification category does not dictate the type of land use that will be allowed in a particular location. Several of the classes provide for and are designed to encourage a variety of land uses.

Although, as indicated above, the specific requirements of the land classification system are set forth at the State level, each jurisdiction's land classification map is developed locally and adopted by the local governing body prior to submission to the Coastal Resources Commission. As a result of this process, the land classification map represents a graphic statement of local government policy with regard to where, when and to what densities future land development will be encouraged.

1. Developed

The purpose the the Developed class is to provide for continued intensive development and redevelopment of existing cities. To be classified Developed, the area should have a minimum density of 500 dwellings per square mile or 1000 people per square mile provided with usual public services including at least water, sewer, recreational facilities, police and fire protection. This category does not apply to Caswell Beach.

2. Transition

The purpose of the Transition class is to provide for future intensive urban development within the ensuing ten years on lands that are most suitable and that will be scheduled for provision of necessary public utilities and services. The Transition lands also provide for additional growth when additional lands in the developed class are not available or when they are severely limited for development.

The Developed and Transition classes should be the only lands under active consideration by the county or municipality for intensive urban development requiring urban services. The area within these classes is where detailed local land use and public investment planning must occur. State and federal expenditures on projects associated with urban development (water, sewer, urban street sytems, etc.) will be guided to these areas. The Transition class is divided into two types of use: Transition Residential and Transition Mixed Use.

A. Transition Residential includes the areas with partial municipal facilities provided usually adjacent to developed residential areas. Only residential use is encouraged in these areas.

B. Transition Mixed Use includes those areas provided with partial municipal services, yet more suitable for a wide range of activity including commercial, recreational, office, and institutional uses, often because of its location to main traffic arteries.

3. Rural

The purpose of the Rural class is to provide for agriculture, forest management, mineral extraction and other low intensity uses. Residences may be located within "Rural" areas where urban services are not required and where natural resources will not be permanently impaired.
This class does not apply to Caswell Beach.

4. Conservation

The purpose of the Conservation class is to provide for effective long-term management of significant limited or irreplaceable areas. This management may be needed because of its natural, cultural, recreational, productive or scenic values. These areas should not be identified as transition lands in the future.

The Conservation class is applied to lands that contain: major wetlands; essentially undeveloped shorelands that are unique, fragile, or hazardous for development; necessary wildlife habitat or areas that have a high probability for providing necessary habitat conditions; publicly owned water-supply, watersheds and aquifers; and forest lands that are undeveloped and will remain undeveloped for commercial purposes.

The projected permanent and seasonal population for Caswell Beach in 1990 is the primary input used in the preparation of the land classification map. The Transition class allocations are all directly related to the expected population level in 1990. The Conservation category is the only class which is in no way related to population, but is allocated based on completely independent criteria.

A. Conservation-Industrial Access: The purpose of this class is to provide ingress and egress to navigational waters for industry. Lands in this category would be maintained in their natural state and would otherwise be classified Conservation. For Caswell Beach, the CP&L cooling canal is classified Conservation-Industrial Access.

CASWELL BEACH LAND CLASSIFICATION MAP

The projected permanent and seasonal populations for Caswell Beach in 1990 are the primary input used in the preparation of the Land Classification map. The Transition Mixed Use and Transition Residential allocations are all directly related to the expected population level in 1990. The Conservation and Conservation Industrial Access are the only Classes which are in no way related to population, but are allocated on completely independent criteria.

Most of the lands within the Caswell Beach City limits meets the criteria for allocation to the Conservation Class. It should be noted, however, that the majority of these Conservation areas are not within the existing development pattern of Caswell Beach. In accordance with State Guidelines, these Conservation lands are areas that are naturally fragile to intensive development, or areas which due to natural or man-made hazards offer some potential threat to development and the public health, safety and welfare. Lands allocated to the Conservation Class should be maintained in a natural state with only very limited non-intensive use. Those lands included in the Conservation Class within the Caswell Beach area are:

a) All lands included in Areas of Environmental Concern
b) Fragile fresh water wetlands with exceptional scenic and aesthic qualities and potential for future passive and active recreational uses.
c) Natural and man-made hazard areas (that is, the CP&L cooling canal as a Conservation-Industrial Access Class).

The Conservation-Industrial Access area for Caswell Beach was placed in the area of the CP&L cooling canal.

In accordance with State Guidelines requirements, the priorities for allocation to the Transition category included those areas which have experienced septic tank problems and/or face potential public health threats in terms of contamination of on-site wells or pollution of estuarine waters to which much existing residential development is adjacent. Another priority provides for inclusion of more areas where future development is expected and can be clustered through the provision of services. In Caswell Beach these areas are also where lands are located along existing water and proposed sewer service corridors where higher density development can be expected.

The Transition-Mixed Use category were allocated to those areas meeting the above criteria but, more specifically, allowing for a variety of land used such as residential, commercial, recreational and institutional.

In constrast to the above category, the Transition Residential Category, while meeting all the same location criteria of a Transition Class, would allow only for residential development.

CASWELL BEACH
LAND CLASSIFICATION MAP

PREPARED BY THE BRUNSWICK COUNTY PLANNING DEPARTMENT

SCALE 1"=400'